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*Archives of Internal Medicine. A. M. A., Chicago.
Archives des Maladies de l'Appareil Digestif, etc. Paris.
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THE USE OF CHLORINE IN WATER PURIFICATION

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That the disinfection of water supplies is considered the most practical of the processes available at the present time is demonstrated by the rapid increase in the number of installations of chlorinators in North America, Central America, South America and Europe, as compared with the number of installations of equipment for the use of ozone and ultraviolet rays. Public health officials have taken into consideration that, given two practical processes of equal efficiency under identical conditions, the most economical one, from the standpoint of operation and maintenance will be selected for installation, except in the case of small filtration plants such as are used for swimming pools, club houses, hotels and bottling works.

I am of the opinion that the disinfection of water supplies by the application of liquid chlorine and calcium hypochlorite is established on such a firm basis that it is unnecessary to defend it against the attacks to which it is occasionally subjected in every country. Of such attacks, undoubtedly the most amusing example is the campaign carried on for the past seven years by a physician in Barranquilla, Colombia, who, in his attempt to sway the populace, has asserted that the use of chlorinated water will cause sterility and consequently a decrease in the birth rate.

In his sixteenth annual report to the Metropolitan Water Board of London, Sir Alexander Houston, director of water purification, and justly termed the "Father of Chlorination of Water," wrote as follows:

> Many persons object most strongly to drinking what they call "doped" water, and consider that the use of chemicals for purification purposes is worse than playing with black magic. Logically, these people would drink only deep well water and water from virgin moorland or upland sources of supply. Obviously, a river draining populated areas, and therefore exposed to sewage pollution, is inadmissible in their case, for, apart from trade wastes, this amount and variety of chemicals poured down house drains and ultimately reaching our rivers gives food for thought. Truly, it is not the nature and amount of these chemicals which matters so much as their ultimate combinations. Many pass into a practically insoluble state; others, originally harmful, are rendered inert by combining with other substances. For example, both caustic soda and sulphuric acid are irritant poisons, but combined in suitable proportions they yield sodium sulphate (Glauber's salt), a mild aperient, liver stimulant and antirheumatic remedy, taken daily throughout most of their lives by a very large number of people. The writer is far from flouting sentimental considerations, but if rivers are to be used as sources of water supply, we must look rather to the innocuous character of the "finished product" than to its antecedents. There is absolutely no convincing evidence that a properly chlorinated water is in any way injurious to health.

In a paper published in 1924, Dr. A. Massink[1] of the government department for supply of drinking water (Holland) wrote as follows:

> The use of chlorination as a means of water-cleansing is comparatively recent. Extensive use has been made of it in America, where the expenditure of water per head is very high, the mud content of the rivers higher than in Holland, and the available space for sand filtration often inadequate. It is resorted to in Holland as a cheap way of obtaining a bacteriologically satisfactory filtrate in cases where the old sand filtration system is unable to cope with extended requirements, as the necessary dose of chlorine amounts only to some 0.3 to 0.5 mg. per liter of water. It is also used as an adjunct to filtration, and to regenerate the water in swimming and other baths, to avoid the expense of frequent refilling with water from the mains.

In a more recent paper, published in 1926, Dr. Massink stated that chlorination was coming into extensive use in Holland.

Dr. A. S. M. MacGregor,[2] the medical officer of health of Glasgow, Scotland, recently made the following statement:

> It is now quite clear that the sterilization of water by means of chlorine is as useful in the larger sphere of civil life as it was in the military water cart. Certain drawbacks connected with the dosage and efficiency of the chlorine and the resulting taste of certain waters are being gradually remedied by scientific investigation, and very important practical results are being obtained by Major Harold at the Army School of Hygiene in this country, and in America by Race, who has devoted special attention to this problem.

The following quotation is taken from a lecture given by the delegate from Colombia, Dr. Julio Aparicio:[3]

> Now we come to the matter of aqueducts, and I must above all else refer to the fight carried on against water-borne diseases, such as amebic dysentery and typhoid fever. This disease was quite common, particularly in Bogota, but thanks to chlorinated water it has decreased considerably and only very few cases are now recorded, and the typhoid fever charts indicate a rapid decrease has taken place since chlorinated water has been supplemented by a start in creating a sewage disposal system. The sterilization system is being eventually extended to all the capitals of the various departments, where also water supply and sewerage works are being undertaken.

Ryukichi Joh,[4] states that calcium hypochlorite was used extensively in 1919 throughout dysentery-stricken areas in Kagawa Prefecture. He is of the opinion that, of the various methods for the chemical sterilization of

1. Massink, A.: Water and Water Engineering, Oct. 20, 1924.
2. MacGregor, A. S. M.: Water Supplies and Public Health, Water and Water Engineering, Oct. 20, 1927.
3. Aparicio, Julio: Eighth Pan-American Sanitary Conference, Lima, Peru, Oct. 13, 1927.
4. Ryukichi Joh: J. Pub. Health A. Japan, April, 1926.

drinking water practiced at present, chlorination is the best in every respect.

Chlorinators are now manufactured in the United States, England, Germany and Spain. This increase in commercial activity furnishes additional evidence that the sales of chlorinators are increasing. In the same way that there are reasons for greater sales of certain types of machines designed for the same class of work, so there are reasons for the greater number of sales of chlorinators as compared with those of equipment for applying ozone and ultraviolet rays to water supplies. These may be stated briefly as follows: The first cost of installation of chlorinators is low as compared with the costs for ozone and ultraviolet rays because the equipment is more compact and occupies a much smaller floor area; the cost of disinfecting a water supply is lower than with either ozone or ultraviolet rays, and the service rendered by chlorinators is more reliable.

What may be called the first practical chlorine apparatus was used in 1913. In 1926 about 4,000,000,000 gallons of water a day was being treated in about 3,200 communities in the United States. Expressing it in another way, it is estimated that 70 per cent of the population of the United States is supplied with water that has been disinfected with chlorine. Among the larger cities in the United States may be mentioned New York (approximate daily consumption, 900,000,000 gallons), Chicago, Philadelphia, Baltimore, St. Louis, Cincinnati, Pittsburgh, Detroit, New Orleans and Washington. The departments of health of the various states have given their approval to the disinfection of water supplies with chlorine and many of them carry emergency portable chlorinators at a central point for quick installation when an epidemic of one of the water-borne diseases breaks out in some community in which disinfection is not practiced or in which there has been an interruption in the service of the filtration plant.

DISTRIBUTION OF CHLORINATORS

The majority of the installations of chlorinators now in service are in the United States but the number of installations in other countries is showing a steady increase each year. The following are some of the better known and larger cities with chlorinated water supplies: Toronto, Canada; Birmingham and London (part of supply), England; Barcelona, Spain; Rotterdam, Holland; Lisbon, Portugal; Essen and Hamburg, Germany; Durban, South Africa; Tokyo (part of supply), Japan; Hong-Kong and Shanghai, China; Bombay, India; Singapore, Farther India; Havana, Cuba; Manila, Philippine Islands; Batavia, Dutch Indies. In an abstract of a report of the Dutch government bureau for supply of drinking water,[5] the statement is made that ozonization has been widely adopted in France, but the application of cheaper chlorine is now more common. In the latter country Bunau-Varilla has developed an apparatus of an entirely different type for disinfecting water with chlorine. It is reported as working successfully in several cities in France.

In Central and South America the number of installations of chlorinators has slowly but steadily increased during the past eight years. The water supplies of Bogota, Columbia, have been chlorinated since December, 1921, with very satisfactory results. The disinfection of one of the water supplies of Medellin, Colombia, during the last two and one-half years reduced the number of cases of typhoid and dysentery in such a striking manner that the authorities started to disinfect the other public supply in the early part of this year. The filtered water discharged from the filtration plant at Cali, Colombia, now in the course of construction, will be disinfected with chlorine. The water supplies of some of the smaller cities are also disinfected with chlorine.

In Chile the installation of duplicate chlorinators in the twenty-two largest cities has been nearly completed and in some of the cities the chlorinators have been in operation during several months. At the end of 1927 it was estimated that about 1,250,000 people, between one third and one fourth of the total population of Chile, were furnished with water disinfected with chlorine. The water supply of Santiago, which has an approximate population of 570,000 and an approximate daily consumption of 45,000,000 gallons of water, has been disinfected for several months and according to private advices an immediate decrease in the infant mortality was observed. On two occasions the chlorinators were shut down and each time the infant mortality showed a marked increase.

I have been informed that the water supplies of all the larger cities in Argentina and Uruguay are chlorinated. In Peru the water supplies of Lima and Callao are being chlorinated, and according to the program of sanitation now being carried out the water supplies of all the larger cities will be chlorinated. The water supplies of the cities of Panama and Colon have been chlorinated during the last twelve years. In Porto Rico the department of health requires the chlorination of surface water supplies.

TYPES OF TREATMENT

The following types of treatment[6] have been developed for the purification of water by application of chlorine, as a result of exhaustive researches by chemists, bacteriologists and engineers:

1. For disinfecting a water supply passing through a filtration plant:
   - (*a*) Simple chlorination.
   - (*b*) Prechlorination.
   - (*c*) Double chlorination.
   - (*d*) Superchlorination and dechlorination.
   - (*e*) Ammonia-chlorine process.
2. For disinfecting a water supply that is not subjected to filtration:
   - (*a*) Simple chlorination.
   - (*b*) Superchlorination and dechlorination.
   - (*c*) Split chlorination.

These types of treatment may also be used for disinfecting water in swimming pools or in water mains; for destroying or retarding algae growths, and for disinfecting water supplies used by armies during wars or by travelers.

A large part of the chlorine which is used in the treatment of water is applied for disinfecting water supplies passing through filtration plants. The addition of chlorine to clear and colorless filtered water discharged from a filtration plant provides an additional and final safeguard against an accidental contamination of the filter effluents through irregularities of operation; it may be looked on as a factor of safety, as a

5. Dutch Government Bureau for Supply of Drinking Water, publication 7, February, 1927.

6. For further details concerning the types of treatment briefly discussed in this paper, the reader is referred to the Chlorine Institute, Inc., 30 East Forty-Second Street, New York, with L. H. Enslow as research engineer, which may be said to be a clearing house for information in regard to the various uses of chlorine in the treatment of water and sewage.

form of insurance for the protection of the consumers or as the last line of defense against water-borne disease germs.

Simple Chlorination.—Simple chlorination is the application of chlorine in one dose to the water discharged from a filtration plant with or without subsequent storage, although the latter is preferable in the majority of cases.

Prechlorination.—This is the application of chlorine to a raw water prior to its filtration. This process has been in continuous and successful operation at a few plants for several years and there is an increasing tendency to employ it. It has been found that the prechlorination of Thames River water (London water supply) has effected a greater degree of purification than a month's storage in the Staines reservoirs, with a considerable economy in operating costs.

The advantages of prechlorination are improved coagulation; greater reduction in color; reduction in the consumption of alum; an increase in the length of filter runs with a reduction in wash water; reduction in the bacterial load thrown on filters by heavily polluted waters, and a reduction in troubles from algae. The process has not proved to be a success with some water supplies on account of the chlorine reacting with industrial wastes containing phenol and producing disagreeable tastes. In other cases it has been reported that excess chlorine has destroyed the coating on grains of the filter sand. Preliminary experiments should be made at any plant where the process is under consideration, so that its advantages or disadvantages may be determined before it is adopted.

Double Chlorination.—This treatment consists in the application of the chlorine to the water in two doses. At several purification plants, which treat raw waters subjected to considerable pollution, part of the chlorine is applied to the water prior to filtration and the remainder to the filtered water. The advantages of this method of chlorination are the same as those of prechlorination, with the additional advantage that the final dosage adds a real factor of safety to the purification process. A further point in its favor has developed at some plants, where it has been found that prechlorination, followed by a secondary application of chlorine to the filtered water, will operate successfully without producing the disagreeable taste that resulted when the chlorine was added only to the filtered water. At a few purification plants the filtered water is chlorinated as it runs into an uncovered storage reservoir and again as it leaves the latter to enter the distribution system.

Superchlorination.—This is a term which covers the use of excess chlorine for destruction of taste, bacteria and algae. In some cases it must be followed by dechlorination; that is, the removal of the residual chlorine by means of another chemical, such as sulphur dioxide.

Houston and Adams in England, and Howard and Thompson of Toronto, Canada, have carried on researches during several years to determine methods of preventing objectionable tastes following the application of chlorine to water. Chlorotastes is a term used to describe such tastes. It is known that industrial wastes from coke and gas plants, the end-products, containing phenols, formed by the decomposition of organic matter, and the oils liberated by algae are in many cases responsible for chlorotastes, but in addition there are other causes of unknown origin.

The first application of superchlorination on a large scale was carried out by Howard and Thompson at the Toronto, Canada, filtration plant, during the last half of 1926. Experimental work had been carried on during a period of three years to determine the causes of the tastes which appeared in Lake Ontario water during the spring and fall. All of the filtered water delivered to the city, 70,000,000 gallons a day, was treated during a period of eighty-four days, with a dosage of chlorine ranging between 0.75 and 1.25 parts per million; after a period of contact of one and one-fourth hours the residual chlorine was removed by the application of sulphur dioxide gas, from 0.28 to 0.62 part per million, to the water as it was pumped into the mains. This treatment was successful, no tastes developing in the water supplied to the city while in a portion which was not superchlorinated a foul taste developed. The city council has authorized the adoption of this method of chlorination at the Toronto plant and has appropriated funds for the purchase of larger equipment. The cost of the treatment is about $1.75 per million gallons of water.

As most of the objections to the disinfection of water supplies by chlorine have been raised because of the production of odors and tastes or an increase in their intensity, this method promises to be of great service in aggravated cases similar to that of Toronto.

Ammonia-Chlorine Process.—This process consists in adding ammonia to a water supply prior to the application of chlorine or in adding a mixture of the solutions of the two gases. Houston, Harold and Adams, in England, have conducted much research work on this process. As a compound called chloramine may be produced by mixing chlorine and ammonia water in certain proportions, this process is sometimes designated as the chloramine treatment.

The use of the process is reported to be very effective in preventing the formation of chlorotastes, and it is also asserted that it possesses some advantages over chlorine alone. The process was used by Race in 1917 in the treatment of the water supply of Ottawa, Ontario, and has been used recently at Greeneville, Tenn., by McAmis, with success.

Disinfection of Water Supplies Not Subjected to Fltration.—There are many public water supplies that require purification plants but their installation is delayed on account of either their prohibitive cost or the lack of public interest. In such cases chlorination serves as a temporary remedial measure, for while it will reduce the death rate due to water-borne diseases it cannot be considered as a substitute for a purification plant, as it will not remove either color or turbidity. New York and Chicago are two outstanding examples of large cities that rely entirely on the chlorination of their water supplies to protect the health of the consumers until filtration plants may be constructed at some future date.

There are also many water supplies from springs, wells or impounded reservoirs which possess a pleasing appearance but are exposed to accidental or intermittent pollution. The chlorination of such supplies is very necessary to protect the consumers against water-borne diseases.

Epidemics of water-borne diseases have been prevented in many communities by the immediate disinfection of water supplies which have been suddenly polluted, as, for example, by floods. Or, if any outbreak of typhoid occurs before it is known that the water supply is polluted, an emergency chlorinator may be installed and the resulting epidemic checked. An indirect but important benefit derived from the instal-

lation of a chlorinator under these circumstances is that an effective demonstration of the value of a pure water supply is presented to the consumers and the administrators of the water works.

The New York Central Railroad disinfects the water that it pumps from the Albany River at Selkirk, N. Y., for use in locomotives and in its yards for various purposes, so that if employees drink this water they will not contract water-borne diseases. The same practice is carried out in some of the large manufacturing plants which have two water supplies, one for industrial uses and another for drinking purposes.

Disinfection of Turbid Water Supplies.—The question is often raised as to the efficiency of disinfection by chlorine of a water supply that is turbid for short intervals, or even continuously throughout the year. I consider that it is more practical and helpful to recommend a process which experience has shown will immediately make the water safer for use, by killing the majority of disease germs in it, even though it is not the ideal process, than it is simply to recommend a filtration plant, when it is known that several years will elapse before the funds will be available for building it. By adopting the latter course no immediate or practical assistance is rendered to a city but by recommending a chlorinating plant a remedy is presented which may be adopted within a comparatively short time at a cost which may be financed without serious difficulty. I believe that one is justified in taking such a position, even though it is certain that not all of the disease germs will be killed.

In recommending the installation of a chlorination plant to the board of public works, Medellin, Colombia, in 1923, I [7] made the following statement: "I am of the opinion that the application of chlorine to the Piedras Blancas water supply will kill the majority (at least 80 per cent) of the disease germs in it and cause a gratifying reduction in the deaths from typhoid fever and dysentery." As stated in another part of this paper, the results of the disinfection of this water supply were so satisfactory that it was decided to disinfect the other public water supply. During the two rainy seasons of each year the turbidity of the Piedras Blancas water supply, following the frequent rains of short duration, ranges from 15 to 200 parts, for a few hours, during the majority of the days of the wet months, and on several days exceeds 1,000 parts.

The disinfection of the five water supplies of Bogota, Colombia, since 1921, when I installed the first chlorinators, has produced similar satisfactory results. On at least two occasions the chlorinators were stopped on account of failure to maintain a supply of chlorine, with the result that outbreaks of typhoid followed immediately. These supplies are also more or less turbid following rains on the watersheds.

In disinfecting water supplies that are not subjected to filtration, "simple" chlorination is used in the great majority of cases. It appears that the effectiveness of the disinfection of surface waters, carrying more or less turbidity following rains on the watersheds, might be increased to a considerable extent by using superchlorination followed by dechlorination. In many cases, however, sufficient storage is not available to provide the necessary period of contact required for the chlorine prior to the removal of the excess by sulphur dioxide or sodium sulphite. The ammonia-chlorine process also might be more effective under these conditions than "simple" chlorination.

7. Empresas Publicas Municipales, Medellin, Colombia, S. A., 1923.

Water supplies that are more or less turbid either continuously or intermittently cannot be disinfected by ozone or ultraviolet rays, as the turbidity interferes with their germicidal action to a much greater extent than is the case with chlorine. In this respect chlorine has a marked advantage over either ozone or ultraviolet rays.

Split Chlorination.—Split or cumulative chlorination, to distinguish it from double chlorination, consists in the application of chlorine to the water supply in more than two doses. In New York City the greater part of the supply is treated twice with chlorine, while another portion is treated at three different points before it reaches the consumers. Brush has described the chlorination of the Catskill supply as follows:

> The water entering Ashokan reservoir through Esopus Creek during the summer season is first chlorinated at Boiceville Station with 2.1 pounds of chlorine per million gallons (0.25 part per million). Upon leaving Ashokan reservoir to enter the Catskill aqueduct it is aerated and chlorinated once more with a dosage of 2.17 pounds per million gallons (0.26 part per million), which is sufficient to maintain a slight excess of active chlorine usually referred to as residual chlorine. Something more than 75 miles south the Ashokan water is delivered into Kenisco reservoir. As this water, supplemented by such water as is gathered from the Kenisco watershed, leaves Kenisco reservoir it is again aerated and again chlorinated with a dosage of 2.17 pounds per million gallons (0.26 part per million) to maintain between 0.1 and 0.2 part per million residual chlorine.
>
> Some 14 miles further this water passes through Hill View reservoir at the northerly city limits. It is proposed to chlorinate the effluent of this small service reservoir also, and thereafter the water will not reach daylight following this final chlorination. Thus it is apparent that New York is not satisfied to be dependent upon a single or even dual chlorination, but rather is safeguarded through the practice of cumulative or splint chlorination, which not only serves to reduce the algae growths in the reservoirs with subsequent taste or odor production, but produces maximum protection with minimum chance of overchlorinating, and simultaneously, a lessened probability of deficiency of sterilization.

CONTROL OF THE DOSAGE OF CHLORINE

Some method of control must be used to insure that sufficient chlorine shall be applied to a water to take care of the amount absorbed by the water and to leave a slight excess for destroying the bacteria. The so-called orthotolidine method has been developed for this purpose but lack of space prevents the inclusion of a description of this method. In the larger communities the dosage of chlorine may be controlled by it and by bacteriologic analyses, one supplementing the other. In most of the smaller communities, without facilities for making bacteriologic tests, the disinfection of the water supply must be controlled by the orthotolidine method. The Enslow chlorine comparator [8] is a simple and practical apparatus for determining the amount of residual chlorine which it is necessary to carry in a water supply to insure effective disinfection. By means of this comparator, residual chlorine may be determined in both turbid and clear waters.

In the disinfection of a water supply, frequent tests should be made to determine the residual chlorine in the water as taken from widely scattered points in the distribution system in order to determine the maximum amount of chlorine which the water will carry without developing an objectionable taste. Many water supplies will carry a residual chlorine content of from 0.10 to

8. Manufactured by the Lamottee Chemical Products Company, Baltimore.

0.20 part per million and a small number will carry as much as 0.5 part without becoming objectionable to the consumer; on the other hand, a considerable number will not carry more than 0.05 part and in a few cases complaints can be avoided only by removing all the residual chlorine from the water before it enters the distribution system.

THE DISINFECTION OF WATER IN SWIMMING POOLS

The following extracts are taken from the report of the Joint Committee on Bathing Places of the American Public Health Association and the Conference of Sanitary Engineers as presented to the Public Health Engineering Section of the association at its convention in October, 1926:

> From all available information the addition of chlorine either as a gas or as a water solution by use of proper apparatus is today the most satisfactory method of pool disinfection. It is possible not only to completely disinfect the entire body of water in the pool with chlorine, but also to maintain in the pool water at all times a residual amount of disinfectant to sterilize immediately any dangerous pollution disseminated by bathers.
>
> Next to treatment with chlorine as gas or water solution, continuous application of a solution of hypochlorite of soda is the most effective method of swimming pool disinfection.
>
> Sterilization of clear water may be obtained by exposure in thin films to ultraviolet rays. This sterilizing action is confined entirely to the period of such exposure and no residual disinfecting action is carried over into the pool. There is never any disinfectant in the pool water to act on infectious material which may be discharged by bathers during the bathing period at the time when such material is most dangerous. In a few cases satisfactory control of the bacterial content of pool water has been reported by the use of ultraviolet disinfection alone. In a considerable number of instances, however, it has been found necessary to reinforce or supplement the ultraviolet treatment by treatment with chlorine or hypochlorites. On the basis of any available evidence the committee cannot recommend the use of ultraviolet ray apparatus alone for disinfection of any pool where the bathing load is high or where large temporary loads are likely to occur.
>
> Judging from a few reports, a reasonably satisfactory disinfection of water may be accomplished by ozone when the necessary apparatus is properly installed and operated. The data on the use of ozone for swimming pool disinfection are very few and inconclusive. There is no evidence that ozone has any residual sterilizing action after the water has been treated, and disinfection must therefore proceed according to the law of consecutive dilution and be subject to all limitations imposed by that law. On the basis of any available evidence, the committee cannot recommend this method for swimming pool disinfection.
>
> Whenever chlorine, calcium hypochlorite or other chlorine compounds are used for swimming pool disinfection, the amount of available or excess chlorine in the water at all times when the pool is in use shall not be less than 0.1 p. p. m. nor more than 0.5 p. p. m. (part per million).

THE DISINFECTION OF WATER MAINS

The disinfection of newly laid water mains by liquid chlorine, in preference to chlorinated lime, is a practice that is rapidly growing in favor among the superintendents of water works because intestinal disturbances among the consumers may be prevented and thereby unpleasant criticisms and notoriety avoided. Any foreign matter in the main should be flushed out and then the chlorine gas may be added to the water through a suitable connection to the auxiliary valve on a cylinder of gas. The water should be allowed to run to waste at the end of the pipe line that is being disinfected until it shows an orange red color when tested by orthotolidine. There is some danger of overdosing the water in the main with the result that the chlorine will attack the pipe coating and impart a taste to the water which will be noticed by the consumers when the main is placed in service.

The gas and water should then be shut off and the latter allowed to stand in the main for several hours, the main then being flushed thoroughly to remove the chlorine-treated water. If circumstances permit, a bacteriologic test of the fresh water standing in the main should be made before the latter is placed in service.

THE TREATMENT OF ALGAE GROWTHS

During the latter part of 1921, fishy tastes appeared in the Catskill water supply of New York City as a result of the chlorine treatment killing one of the algae known as *Synura* and liberating oils which imparted the objectionable tastes. In this case it was found that a larger dose of chlorine had to be used than was necessary for killing *Synura* in order to destroy the oils liberated by the disintegration of the organisms. A dosage of from 0.6 to 0.7 part per million of chlorine, of which 0.28 part was excess residual chlorine, worked successfully and the chlorine taste disappeared within twelve to twenty-four hours. This furnishes another example of the successful application of superchlorination.

During the last two years considerable experimental works and practical applications have been carried on in connection with the prevention and retardation of algae growths in open tanks, service reservoirs, and swimming pools with very good results. Enslow says:

> The results secured so far indicate that certain forms of algae are more resistant to copper sulphate than to chlorine and, further, that in certain instances the use of copper sulphate will prove more expensive. It would appear that application of chlorine to insure a residual of 0.5 p. p. m. will effectively kill most forms of algae so far encountered.

THE TREATMENT OF WATER SUPPLIES USED BY ARMIES

During the World War, liquid chlorine and calcium hypochlorite were used extensively and proved to be very practical and effective disinfectants for the emergency water supplies that were developed by the various armies. Danforth states that 0.5 part per million of residual chlorine was the minimum prescribed for water purified by the mobile purification unit. Sodium hyposulphite was sometimes used for dechlorinating waters overtreated with chlorine if the taste of the water was so objectionable to the troops as to cause them to drink from unpurified sources. He also states that it is desirable to hold the residual chlorine to 2 parts or less and that it may be easily kept below 1 part when tests are possible. For sterilizing small quantities of water, ampules containing 1 Gm. of calcium hypochlorite were often used.

THE TREATMENT OF WATER USED BY TRAVELERS

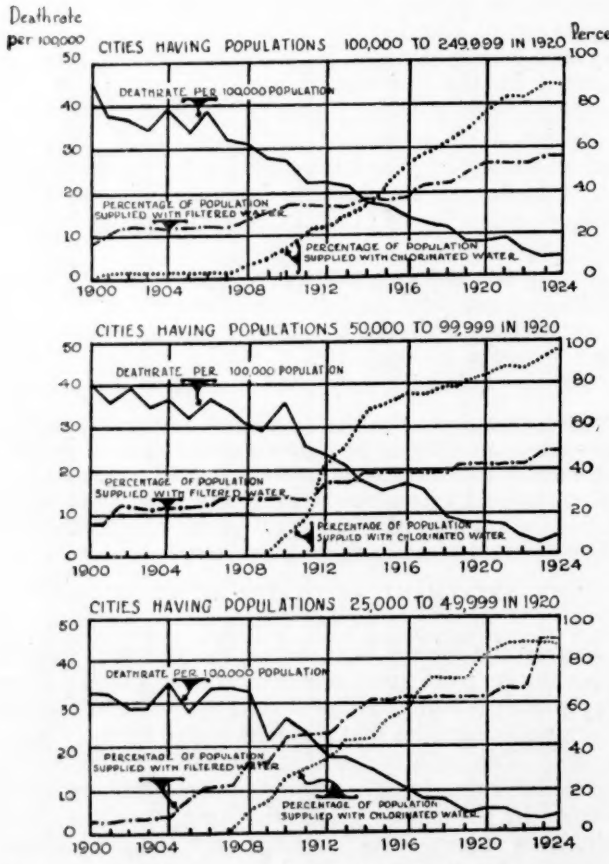
Travelers to whom safe water supplies are not available should carry tablets containing a compound of chlorine so that they may disinfect their drinking water as well as that used for cleaning the teeth. A Berkefeld filter pump number 3 should also be carried, for it occupies only a small space and will permit the traveler to filter small quantities of turbid water very quickly. However, the filtered water should always be disinfected as it is not safe to rely on the removal of all the disease germs by the filter. For clarifying larger quantities of water, aluminum sulphate should be carried. Of the tablets available, one bearing the name

of halazone[9] has been found to be very satisfactory. When protected against moisture and kept away from strong light and preferably in a cool place, this tablet should maintain its strength for at least one year. However, as the tablets are inexpensive, it is best to secure a fresh package prior to each trip.

TYPHOID IN RELATION TO FILTRATION AND CHLORINATION OF MUNICIPAL WATER SUPPLIES IN AMERICAN CITIES, FROM 1900 TO 1924

The following quotations[10] show the relation between typhoid and the water supply:

It is well known that during the past twenty years typhoid fever as a cause of death has sharply declined, until today it has become a very minor element in the general mortality


Deathrate per 100,000
Percent
CITIES HAVING POPULATIONS 100,000 TO 249,999 IN 1920
DEATHRATE PER 100,000 POPULATION
PERCENTAGE OF POPULATION SUPPLIED WITH FILTERED WATER
PERCENTAGE OF POPULATION SUPPLIED WITH CHLORINATED WATER
CITIES HAVING POPULATIONS 50,000 TO 99,999 IN 1920
DEATHRATE PER 100,000 POPULATION
PERCENTAGE OF POPULATION SUPPLIED WITH FILTERED WATER
PERCENTAGE OF POPULATION SUPPLIED WITH CHLORINATED WATER
CITIES HAVING POPULATIONS 25,000 TO 49,999 IN 1920
DEATHRATE PER 100,000 POPULATION
PERCENTAGE OF POPULATION SUPPLIED WITH FILTERED WATER
PERCENTAGE OF POPULATION SUPPLIED WITH CHLORINATED WATER
1900 1904 1908 1912 1916 1920 1924

Typhoid control through filtration and chlorination of water supplies in American cities from 1900 to 1924, by size of city. Courtesy of Statistical Bureau, Metropolitan Life Insurance Company.

record of American cities. Although this achievement can be attributed, in part, to the adoption of such means as pasteurization of the milk supply, the installation of proper sewage disposal, and the regulation of food handlers with a view to controlling the hazard of infection from typhoid carriers, the chief factor in the suppression of the disease in cities has undoubtedly been the purification of water supplies.

A glance at the graphs clearly shows the potent influence that purification of the water supply has had in reducing the typhoid death rate. During the first decade of the twentieth century, the mortality from typhoid fever was high in all three groups of cities, ranging from 25 to 45 per hundred thousand of population. Very little attempt at water purification was made during these early years. Up to 1908 less than a third of the total population of each group was supplied with filtered water and practically no water was chlorinated. But about 1907 public interest in this phase of modern sanitation became awakened and from then on such measures were rapidly adopted by increasing numbers of cities, until, in 1924, approximately 90 per cent of the combined population of these communities were using water sterilized with liquid chlorine, and above 50 per cent had water mechanically filtered or sand filtered.

The efficacy of these measures was immediately evident. A decided drop in the annual death rate promptly took place and the rate proceeded to decline regularly thereafter from year to year almost in exact accordance with the increased percentage of the total population using purified water. Much the same result was achieved in the larger cities (above 250,000 of population), the individual records for which will be discussed in the forthcoming monograph.

By 1924, the mortality from typhoid fever had decreased in all three groups to about 4 per hundred thousand of total population, which is equal to a decline of about 90 per cent from the average death rate prevailing during the first few years of the century.

A feature worth noticing is the manner in which the death rate declined after the cities began to adopt purification methods. Before 1910, the mortality fluctuated decidedly from year to year, but after that time very little variation in the mortality curve is discernible.

Apparently the preferred method of water purification has been with liquid chlorine, particularly in cities with populations under 100,000. The filtration method has been more generally used by the larger municipalities. Of course, many cities have adopted both methods. This is generally considered the better procedure since the use of either method by itself has not been found to be thoroughly reliable.

CONCLUSION

The disinfection of water supplies by chlorine now occupies a definite position among the standard methods of purifying water. During the last five years, noteworthy improvements have been made in chlorinators by the manufacturers with the result that new types have been developed and many of the delicate parts of the first types eliminated. These improvements have lengthened the life of chlorinators and eliminated many of the "troubles" of the operator.

In Central and South America, as well as in other countries located at a considerable distance from the points of production of liquid chlorine, it appears that "electrolytic chlorination" of water supplies is a logical development. By this term is meant the production of chlorine by the electrolysis of common salt and the provision of suitable apparatus for its application to a water supply. The high cost of chlorine in the interior cities of these countries, together with the uncertainties and delays in the transportation of liquid chlorine from the chemical works in foreign countries, combines to favor the installation of small electrolytic combines.

The most important unit of the apparatus is the electrolytic cell, and unless the proper cell is selected it is a waste of time and money for a water works or a municipality to adopt electrolytic chlorination. The only other requirement to insure the success of this method is that electric current must be available which is not subject to frequent and lengthy interruptions. This difficulty may be taken care of by the installation of a small generating unit for emergency use; or a chlorinator may be provided for emergency use and a few cylinders of liquid chlorine carried on hand.

9. New and Nonofficial Remedies, 1928, p. 202.
10. Statistical Bulletin of the Metropolitan Life Insurance Company, New York, March, 1927.

Ruptured Tubal Pregnancy.—The first operation for ruptured tubal pregnancy was performed by Tait, in 1883. Dr. Charles K. Briddon of New York in the same year performed the first operation in America for this condition. He made the correct diagnosis and proved it by removing a fetus and a ruptured tube.—Pollok, L. W.: Extra-Uterine Pregnancy: Analysis of Twenty-Eight Cases, *Texas State J. Med.*, December, 1928.

DYSPEPSIA DUE TO GALLBLADDER DISEASE *

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For years the diagnosis and treatment of appendicitis held first place in medical discussions. Then, the subject seeming largely exhausted, attention was focused on other problems with the result that many of the younger men of the profession had a more or less academic knowledge of the disease and it was necessary again to start discussion of appendicitis as an educational measure. That this is needed still is emphasized by the mortality statistics of the states of Oregon and Washington, where the death rate from appendicitis has risen 30 per cent in the last decade. Physicians may lay the blame to neglect and delay of proper treatment by cultists of various kinds, but search for our own possible errors is in order.

Gallbladder disease is still a live subject for discussion and new facts are being brought out constantly but, for the benefit of our patients, certain known facts must be presented again and reemphasized. Too large a proportion of cases of the disease go undiagnosed; too small a proportion of its victims receive surgical relief, and but little attention has been given to the problems of medical management of those patients who refuse surgical aid or who, for one reason or another, are not considered as subjects for surgical care.

Up to Jan. 1, 1928, registrations at the Mason Clinic, Seattle, totaled 26,500 patients in all departments. Only 8 per cent were under the age of 15, so that for practical purposes this may be considered a group of adults.

Of these 26,500 patients, 1,004 were diagnosed as having disease involving the gallbladder or bile ducts. This is an incidence of 3.8 per cent. If the 8 per cent under 15 years of age are eliminated, the incidence is 4.1 per cent. The figure should be even higher, as among the registrants were many with accidental injuries and other complaints on whom no detailed study was made. Dwyer and Blackford,[1] taking their figures from an earlier group of the same cases, stated that 20.4 per cent of patients complaining of stomach trouble suffer from gallbladder disease. Their figures do not include all the gallbladder diagnoses up to that time, as only those subjected to detailed clinical and roentgenologic study were reported on and no account was taken of those patients who were operated on for an acute cholecystitis or in whom a history of gallstone colic was so definite as to make the diagnosis certain without detailed study. That gallbladder disease occupies first place as a single cause of stomach complaint is evident from their statement that all organic stomach diseases together caused only 14.3 per cent of gastric symptoms, as against 20.4 per cent caused by derangement of the gallbladder.

The dyspepsia caused by disease of the gallbladder has been emphasized time and again but it still occupies in the lay and professional mind a position secondary to that of pain. This is perhaps natural, as gallstone colic is a dramatic and compelling event and not to be ignored or forgotten. But its frequency as a cause of complaint as compared to indigestion is only as one to two. In our series the early and prominent symptoms were dyspepsia in 64.5 per cent and pain in 35.5 per cent of the cases.

SYMPTOMS

The symptoms classed as dyspepsia are many. The most common complaint was of gas, distention and belching; closely following was inability to eat certain foods without distress; food selection, sour stomach and heartburn, acid eructations, bilious spells and occasional nausea and vomiting were next in order, and dizziness, irregular appetite, headaches, constipation and vague abdominal and chest pains often were associated. Relief on the taking of sodium bicarbonate was frequent but seldom was food relief admitted—more often abstaining from food gave most relief.

All these symptoms are common to dyspepsias of other origin, but their association in such a group, accompanied in at least one third of the cases by occasional severe radiating epigastric pain, in another third by pain of less severe character or by occasional jaundice and septic symptoms, with frequently absent or low gastric acids, and with the evidence of a negative roentgenologic report on the stomach, makes the certainty of correct diagnosis between 90 and 95 per cent as checked by surgical operation. When to the history and observations is added the positive aid of cholecystograms, the diagnosis of gallbladder disease becomes reasonably precise. The surgeons' observations have supported the preoperative diagnosis in well over 90 per cent of the cases.

Disregarding the severe pain of gallstone colic which is due to spasm and the attempted passage of gallstones, disregarding the pain of acute infection of the gallbladder which is caused by distention and localized peritonitis, and disregarding the symptoms caused by temporary or permanent obstruction of the ducts, we ponder the cause of dyspeptic symptoms. It is probable that most of the so-called dyspeptic symptoms are caused either by pylorospasm or by reverse peristalsis. A diseased gallbladder fails to perform one or all of its several functions. A completely blocked cystic duct precludes any function of the gallbladder. It cannot receive or concentrate bile and so cannot, as Mann hypothesizes for a normal gallbladder, empty a concentrated bile into the duodenum at the moment of discharge of chyme through the pylorus, thus "throwing the liver into high," so to speak. Inflammatory disease of the gallbladder, communicating itself to the ducts and nearby duodenum and stomach antrum, may make these portions of the digestive tube abnormally sensitive and prone to pathologic response; i. e., spasm or reverse peristalsis. Further, failure of the gallbladder to empty its concentrated bile into the duodenum at the proper time may fail to initiate the bile producing reflex and the acidity of the chyme may be poorly neutralized; thus the same pathologic response of spasm or reverse peristalsis is initiated. Then, too, irritation of any part of the gastro-intestinal tube tends to interfere temporarily with the production of gastric acids. Gallbladder disease, of all pathologic conditions involving the digestive tract, is most often associated with lowered or absent gastric acids. That an abnormal irritability of the duodenum is present is suggested by the fact that the distress is present soon after any rough or stimulating meal and appears as promptly when anacidity or low acidity is present as it does in the presence of normal acids. A peculiar observation has been made that, in patients obtaining relief of symptoms from the taking of sodium bicarbonate, gastric analysis

* Read before the Section on Gastro-Enterology and Proctology at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 14, 1928.

1. Dwyer, M. F., and Blackford, J. M.: Clinical and Roentgenologic Findings in Three Hundred and Thirty-Two Organic Gastric Lesions, Northwest Med. 25: 595 (Nov.) 1926.

nevertheless often shows low or absent acids. This observation, to my mind, supports the hypothesis of a probable existence of a hyperesthetic duodenum and pyloric region. The existence of actual inflammation in disease of the biliary tract seems all important in causing dyspeptic symptoms; gallstones may be present for years without a single symptom or without symptoms other than occasional colic. When the colic is over, the patient is well. It is necessary to assume that in such cases the inflammation is negligible.

In 200 consecutive patients whose histories were recently studied, it was found that seventy-one, or 35.5 per cent, had normal amounts of gastric acid; eighty-two, or 41 per cent, had low acid concentrations, and in forty-seven, or 23.5 per cent, acids were absent. Thus 64.5 per cent were found to have low or absent acids. No record was found of any patient who had high acids in whom a diagnosis of gallbladder disease had been made, and on analyzing the histories it was found that most of the questionable diagnoses were in the group having normal acids. In other words, a high concentration of gastric acids in a patient with stomach complaint argues against the gallbladder's guilt. Conversely, low or absent acid speaks volumes for it.

Cholecystograms have been a great aid in the diagnosis of gallbladder disease. We have studied 550 patients by this method and are satisfied with our results. Positive evidence of gallbladder disease in the form of absent gallbladder shadow, faint or deformed shadow, or gallstone shadows, either positive or negative, we hail with delight when it confirms our clinical opinion, and such observations often crystallize that opinion. On the other hand, failure to confirm clinical opinion by this method must not necessarily negate the diagnosis. We have diagnosed gallbladder disease clinically when the symptoms were classic but the cholecystograms negative in 22 per cent of our cases. Cholecystography is a test only of gallbladder function, and even a gallbladder containing stones may function well. We believe that many gallbladders, like other organs, may function well at one time and badly at another. I cannot see any reason why gallbladder function should not be interfered with reflexly by disease of a distant abdominal organ, just as we all admit that gastric function may be interfered with. At all events, our clinical judgment has been upheld by the surgeon a sufficient number of times so that we do not hesitate now to disregard a negative cholecystographic report when enough clinical evidence is present.

TREATMENT

Our early enthusiasm for intravenous administration of the dye was considerably dampened by the occurrence of several very sore arms as a result of technical error and of a number of disturbingly severe general reactions. For more than a year the oral method was used and intravenous administration was reserved as a check in doubtful cases. The plan worked well in patients with normal gallbladders, but the proportion with equivocal results requiring a second study after intravenous administration was so high and the expense so excessive in material and in the patient's time that the intravenous method was again adopted as the method of choice. We are more than ever pleased with the results of the return to the intravenous method.

With greater care in preparation and administration, no really severe general reaction has occurred in the last 200 cases, and only one sore arm, a technical error, has resulted. Venous thrombosis, however, is not uncommon and is at times annoying. Cholecystographic studies are made, if indicated, before roentgenologic studies of the stomach and bowel, as several days must elapse after barium has been given before the gallbladder study can be made.

Although dyspepsia as the principal complaint is twice as frequent as pain, pain brings the sufferer from gallbladder disease to the physician earlier than indigestion. The average period of complaint for pain only is 7.3 years; for dyspepsia, 10.8 years, and this in spite of the fact that some patients have endured recurring attacks of gallstone colic for upwards of forty years.

Of those patients who had no free hydrochloric acid in their stomach contents, one half complained of pain as the most prominent symptom and one half complained of indigestion.

The longest history of pain was given as forty years, by a man of 69, and the shortest as three days, by a girl of 16.

The oldest patient in whom the diagnosis of gallbladder disease was made was 77; two patients, one a boy, the other a girl, were operated on and gallstones were removed at 15 years of age; one patient, whose diagnosis of gallstones was confirmed doubly by positive shadows on an x-ray plate and by the surgeon, gave a history of typical gallstone colic recurring from the age of 3 years. The average age of patients with gallbladder disease was 46 years. Singularly enough, this was also the average age of those operated on and was the same for men and for women.

That women submit to operation more readily than men is suggested by the fact that of the operations, 73 per cent were performed on women and only 27 per cent on men, in spite of the fact that the diagnosis was made in 63.5 per cent of women and 36.5 per cent of men.

Gastric and duodenal disease is frequently associated with that of the gallbladder. One gastric ulcer, one case of polypi in the duodenum, one case of duodenitis, two diverticula of the duodenum and six duodenal ulcers, three cases of cholecystoduodenal fistula or stone perforating into the duodenum, and two cases of deforming adhesions between the gallbladder and duodenum were found in 206 operations, an incidence of associated gastric and duodenal disease of 8 per cent.[2]

Seven patients, or 3.5 per cent of those operated on in the last seven years, had diabetes. One had transposition of the abdominal viscera with gallstones on the left side. Fortunately, the diagnosis of the transposition and of stone, too, was made by the roentgenologist. The heart was not transposed.

Gallbladder disease, though admittedly a condition calling for surgical treatment, has in our hands come to operation in only 24.5 per cent of cases. Operation has been recommended in approximately twice that number of cases. Medical or expectant treatment has been urged in the remainder. The indications for nonsurgical treatment are:

1. Advanced age without seriously disabling symptoms.
2. Advanced cardiac, renal and arterial disease.
3. Symptoms so mild and recent that a moderate regimen results in a degree of relief satisfying to the patient. The patients of this group should be given the

2. In a recent personal communication to the author, Eusterman stated that in a series of 4,679 benign ulcers of the stomach and duodenum (chiefly the latter) operated on at the Mayo Clinic during a five year period, there were 402 instances of gallbladder disease, or an average of 8.59 per cent. Fifty-four per cent of these patients had gallstones, and in 80 per cent of the total number the pathologic condition of the gallbladder was remedied surgically at the time of operation on the stomach.

choice of medical or surgical treatment. In those declining surgical treatment an effort should be made to determine by observation and treatment which patients fail to receive adequate benefit from medical management and these should be urged to submit to operation. We believe that all patients with associated lesions of the stomach and duodenum had best be treated surgically and that in diabetes with active gallbladder inflammation the gallbladder should be removed to conserve the pancreas.

Many patients who should be operated on refuse surgical treatment. Even these mistaken ones are entitled to our interest and usually can be improved by medical care.

The medical management of the dyspepsia is largely dietetic and, in general, consists in avoiding the foods and conditions known to aggravate the symptoms. The following factors should be observed:

1. Avoidance of large meals. Overloading the stomach commonly causes distress. Many of these patients are already overweight.

2. Avoidance of roughage, especially uncooked fruits and vegetables, their seeds and skins, and tough meats.

3. Avoidance of fats, especially the fats of meats more or less burned in cooking. Butter and cream are less objectionable. Pastries, rich foods, greasy gravies and mayonnaise are usually objectionable.

4. Avoidance of condiments and of alcoholic drinks; beer is probably most objectionable. Acids often cause distress.

5. Avoidance of constipation. Agar-agar, liquid petrolatum and bile salts in sufficient dosage help constipation and supply a necessary cholagogue when given after meals. Some claim to be benefited by self prescribed saline laxatives. A large amount of fluid daily is required.

It has been our experience that most patients with low or absent hydrochloric acid not only are not benefited by its administration but are intolerant of it and are likely to complain more when it is given.

Symptomatic relief from the belching and discomfort of gaseous distention is often secured by the judicious use of bromides, pepsin and charcoal (Hammond's mixture).

SURGICAL MORTALITY

Surgical mortality is a subject few surgeons can agree on. Bare figures mean little. The lowest published figures seen are Judd's 1.7 per cent. Most operators give 4 and 5 per cent. Urgent surgery supplies the highest death rate. Analysis of the type of surgical risk is of more value than the total rate. In 206 operations since 1920, performed on patients with preoperative diagnosis of gallbladder disease, fourteen patients died, a mortality of 6.7 per cent. Of twenty-nine patients operated on for such acute conditions as empyema of the gallbladder, empyema with general peritonitis and allied conditions, eight died, a mortality of 27.5 per cent; of 177 patients operated on for chronic troubles, including carcinoma of the bile duct and one carcinoma of the head of the pancreas, only six died, a mortality of 3.3 per cent.

A further analysis of the cause of death in these fourteen patients discloses the fact that many were desperately ill at the time of operation or were noted as bad surgical risks otherwise:

1. One patient operated on for acute empyema of the gallbladder died at the seventh day of bronchopneumonia.

2. One with gallstones and empyema developed a subdiaphragmatic abscess and died of a septic pneumonia twenty-eight days after the primary operation.

3. One died of bronchopneumonia eight days after operation —an unexpected event.

4. One died of a terminal pneumonia thirty-six days after drainage of the gallbladder for acute hemorrhagic pancreatitis.

5. One, a woman of 75, operated on for gallstones, empyema of the gallbladder and a then existing general peritonitis, under local anesthesia, died after eighteen days.

6. One who refused operation for five days for acute empyema of the gallbladder was found at operation to have a ruptured gallbladder and peritonitis from which he died eight days later.

7. One elderly woman, very ill with a chronic pancreatitis and hepatitis, died in one day of shock and inanition.

8. One patient with carcinoma of the bile ducts died in one day of exhaustion.

9. One woman, aged 54, with marked hepatitis and stone in the common duct, died eleven days after operation, apparently of hepatic failure.

10. One patient operated on for acute empyema died forty-two days later of lung abscess.

11. One patient, aged 69, died of heart failure two days after operation for stones.

12. One died five days after operation as the result of slipping of the ligature from the cystic duct, with consequent peritonitis.

13. One patient with a double pyelitis died thirty-seven days after cholecystectomy for stones and empyema, of urinary suppression.

14. One died, four days after removal of a stone in the cystic duct, of urinary suppression.

CONCLUSIONS

1. Gallbladder disease is the commonest cause of dyspepsia.

2. Dyspepsia causes complaint twice as often as pain.

3. Gastric acids are low or absent in 64.5 per cent of gallbladder patients. Hyperchlorhydria practically does not occur.

4. At present fewer than 33⅓ per cent of sufferers from cholecystitis come to operation.

5. Gallbladder operations, when done by competent surgeons in uncomplicated cases, have a very low mortality rate (from 2 to 5 per cent).

6. The operative mortality rate rises very rapidly when acute complications are present (from 5 to 40 per cent).

7. Careful medical management has its application in the treatment of chronic cholecystitis.

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ABSTRACT OF DISCUSSION

DR. H. J. LEHNHOFF, Lincoln, Neb.: There is nothing so important in the diagnostic methods that have been developed in the last five years as cholecystography. Yet, I think, we gastro-enterologists are inclined to be swept off our feet by it. As Dr. Graham said, we are too much attracted by this roentgen work on the gallbladder. The appreciation has been too great. Our attention is too strongly drawn in that direction and we are liable to forget the other important observations in gallbladder disease. With regard to the incidence of gallbladder disease, Dr. Dowling found that one out of every twenty-five patients had gallbladder disease. That is a good point to remember, but the incidence is not high. If not more than one case in twenty-five is discovered, something is being overlooked. The next point of incidence has to do with the number of patients having gallbladder disease, among whom are those suffering from gastro-enterologic symptoms. In Dr. Dowling's review, one out of every five patients with abdominal symptoms had gallbladder disease. Likewise, in this group I think we are overlooking something if, in five patients coming for examination because of stomach or bowel disturbances, we do not discover one who has gallbladder disease. Again, this incidence is not too high. Among the patients coming to our little group in Nebraska, I feel that the incidence is higher than that. The symptoms of gallbladder disease

are usually of long standing. For a number of years we have emphasized the fact that the symptoms in peptic ulcer are of long standing before the patient comes to us. I think the general average is eleven years. In our group, in the cases of gallbladder disease reviewed three years ago, the time of suffering before the patients came to our office averaged eight years, which indicates that there is not a great deal of difference in this respect between patients with peptic ulcer and those with gallbladder disease. The terms dyspepsia and indigestion cover a multitude of symptoms. For the last five years I have never written the term indigestion or dyspepsia into my histories unless it was written with quotation marks. If a patient says he has dyspepsia or indigestion, I ask him what that means and he immediately says something else. One of the most common complaints in gallbladder disease, in my estimation, is a feeling of weight or of a load in the epigastrium or a feeling of something not moving along. The next most common and, to me, the most characteristic sign in gallbladder disease is the fact that the patients feel better and have fewer stomach symptoms if they eat less. The third most common symptom, in my experience, is the accumulation of gas. There are three fairly common abdominal conditions that simulate gallbladder disease, from which the latter must be differentiated. They are: chronic peptic ulcer, so-called chronic appendicitis, and chronic spastic colitis.

DR. A. F. R. ANDRESEN, Brooklyn: I am very glad that Dr. Dowling emphasized that there is a medical treatment. I also wish to emphasize another thing that he mentioned—the fact that the symptoms are really of two types, namely, the local symptoms due to the presence of gallstones or adhesions, in which there may be colic, or simply a feeling of weight in the gallbladder region, and the symptoms that I believe are due to reverse peristalsis and to inflammation in the stomach and duodenum. Dr. Dowling feels that gastroduodenitis is rather rare in gallbladder disease. I believe that the very roentgen observations that we formerly described as being characteristic of gallbladder disease, the so-called indirect symptoms in the duodenum, the cupping and stiffening of the duodenal cap, were really due to a gastroduodenitis. Surgeons who look particularly for evidences of gastroduodenitis and hepatitis have found that these conditions are practically invariably present at the time of operation for gallbladder disease. I have come to assume that a gastroduodenitis is a part of chronic gallbladder disease. I believe that the symptoms are due more to this gastroduodenitis than they are to the gallbladder itself, but that they are influenced by stasis in the gallbladder. Patients with gallbladder disease often eat very little, with the result that the normal stimulus to gallbladder emptying, the passage of food through the duodenum, does not take place, and the gallbladder fails to contract with sufficient frequency and force to keep up its normal tone. Realizing this fact, it is important in the dietetic treatment not to give a one-sided restricted diet, but a well balanced, meat-free diet, perhaps a little high in fat (because that especially stimulates the emptying of the gallbladder), with at least six or eight feedings a day. Gallbladder drainage is better stimulated in this way than by duodenal instillations.

DR. FREDERICK EPPLEN, Seattle: I am not agreed that the first part of the medical treatment is of great importance, as the author seems to think. It seems to me that most cases of cholecystitis that I have treated medically have ultimately brought discredit on me. I think gallbladder disease is primarily a surgical disease as far as treatment is concerned. I agree that dyspepsia is the first symptom these patients manifest and is the one which leads to diagnosis. We should not wait for pain. However, when a patient says, "I have a pain here," and pulls his hand along the last rib, I think the diagnosis is almost certain from that one point. I think that one of the most valuable points brought out by Dr. Dowling is that no cases have been found in which there is a high acidity, which frequently will allow the physician to differentiate between ulcer and direct gallbladder disease. I question the point brought out about a noninflammatory stage in gallbladder disease. I believe that in all cases there is a certain amount of inflammation present. Perhaps the speaker had in mind acute inflammatory manifestations. I quite agree that cholecystography is only a corroborative finding. I think that we should make our diagnosis from the knowledge of the history and symptomatology of gallbladder disease without cholecystography. In a great many cases in which I suspect cholecystitis, I do not use cholecystography, especially when the patient cannot afford to pay for it.

DR. ANTHONY BASSLER, New York: I think that we should always try to interpret the symptomatology on the basis of disease or disturbance of function. In 400 cases of diseased gallbladder, in which the diagnosis has been confirmed, we succeeded very little in the explanation of symptoms on the basis of hyperacidity or anacidity. The stiffening of the duodenum and the white spots that one sees at operation in cases of chronic duodenitis also have not helped very much to explain the symptoms. Hypersensitiveness of the duodenum is a theoretical problem, one that I doubt will ever be worked out. Forty per cent of persons with chronic gallbladder disease at the time of examination have definite pancreatic dysfunctions, which, in a great majority of cases, are not restored to normal until from six weeks to six months after operation. The pancreas has to be taken into consideration as an explanation of symptoms, and in my opinion it is the most important one. It is true that the highest figure surgeons have given with regard to involvement of the pancreas in gallbladder disease is 20 per cent. I have said 40 per cent and certainly the congestion and the stiffening of the pancreas that commonly accompany gallbladder disease can cause symptoms that very closely simulate gallbladder symptoms. Even after the gallbladder has been removed, the symptoms of the original condition not uncommonly persist, and in that rather large group of persons, the explanation is found not in the gastric secretions or in duodenitis, but in deficiency of pancreatic function. It can be proved by testing and by pancreatic feeding that the vast majority of patients are promptly rendered free from symptoms by proper diet and pancreatic feeding.

DR. FRANK SMITHIES, Chicago: I wish to mention two things in explanation of the symptoms. To begin with, the condition is a pyloric and gastric spasm. One of the causes of this pyloric and gastric spasm is embryologic. The midintestine, of which the stomach is a part, has, as one of its derivatives, the liver and the biliary tract. When these evolve into specially functioning organs, they carry their initial embryonic innervation. When there occurs any biliary tract irritation, pyloric and gastric spasm follow because the excitation produces contraction proximally to the irritated point. Embryologically, the adjacent proximal zone is the pyloric and stomach musculature. Secondly, the hormonal theory explains why pain occurs immediately or soon after eating. These hormones occur in the duodenal and jejunal juices, or with their secretion. Apparently one hormonal attribute is that of exciting bile production; another appears to initiate biliary tract contraction, as recently described by Ivy. The latter function influences contraction of the intrinsic muscle along the biliary tract, including the gallbladder. In cases in which there is difficulty in free emptying of the gallbladder, it may be that there is, as a compensatory phenomenon, an increased output of Ivy's motor hormone. This increased motor urge may explain why there occur the symptoms of stasis, gas, pressure or pain. With the subacute cholecystitis in the "strawberry" gallbladder, quite frequently one finds increased hydrochloric acid secretion. This makes up the group of cases which very commonly and wrongly is diagnosed as peptic ulcer and in which often treatment for peptic ulcer is given. One should exercise extreme caution in diagnosing gallbladder disease and gallbladder function by the so-called Graham test. Even in the hands of such experts as Dr. Case, the results are far from convincing. One need have little imagination to appreciate how, when the Graham test is performed and interpreted by the general practitioner, many needless operations may follow.

DR. G. A. DOWLING, Seattle: The investigation which I conducted in preparing for this paper convinced me of the value of low acids as a corroborative piece of evidence in the diagnosis of gallbladder disease. As to the term primary achlorhydria or primary anacidity, I quarrel with anything that is primary. Primary is merely a word that we use to cover our ignorance. Probably we should say idiopathic instead of primary. We speak of primary anemias or idiopathic perni-

cious anemia. We might just as well speak of idiopathic achlorhydria. It is just as sensible, to my mind, in fact, more sensible. In most instances one has to look for a cause of the low acids. Dr. Epplen may have a little more temerity in ordering patients to be operated on, but I have to live with my patients after they are operated on and I do not dare advise operations unless I think the condition will be improved thereby.

ANEMIA IN LATE PREGNANCY

PRELIMINARY REPORT *

EDWARD C. LYON, JR., M.D.
NEW YORK

At the Woman's Hospital a considerable number of patients have been admitted to the obstetric ward, who clinically appeared anemic, and who, on examination, were found to have a low red cell count and a low hemoglobin estimate. This condition seemed the more surprising because of the class of patients applying for care. While some of those admitted to the hospital live under very bad social conditions, the majority of them are from hard working, simple living, families who are never in actual want. Realizing that all these patients were not reaching term in as satisfactory a condition as was desirable, I undertook a closer correlation of the work of the prenatal clinic with the inside ward service. A more careful study of the case was planned for the prenatal clinic, so that the patient would reach the delivery room with full data available and with abnormal conditions corrected as far as possible. Among the various examinations which are made now, that of the patient's blood is considered very important. This work on anemia was started a little more than a year ago, but most of it has been done since Oct. 1, 1927. The object has been first to establish the incidence of anemia among the clinic patients, and then to study these cases of anemia in the hope that some data might be obtained as to the cause, and the best methods of treatment and prevention. This paper deals with the incidence of anemia in the series of cases so far studied, and in a later report will be discussed what I have been able to determine about the causative factors.

Red cell counts and hemoglobin estimates have been done on 200 prenatal clinic patients. These examinations were made in most cases by the regular laboratory technicians but in a few by the junior intern, and the Sahli hemoglobinometer was used throughout. The patients were not selected but were taken as they reported to the clinic or as they came from the clinic to the hospital for admission. Their ages varied from 17 to 45 years, 125 being between 21 and 30 years; 131 were primiparas and sixty-nine multiparas. Twenty-seven showed symptoms of toxemia, and 173 were nontoxic; 190 had negative Wassermann reactions, while two were positive for syphilis and three gave indeterminate reactions; in five, no examination had been made. Such a nonselected group as this, I felt, might be considered as a general average.

In studying the results of the blood examinations made on these women, I have looked for the answers to two questions, viz.:

1. How many showed an anemia at term; i. e., how many were good risks when they went to the delivery room, and how many, because of an anemia, were poor risks and ill prepared to stand a difficult delivery or a more than normal loss of blood?

2. How many had a progressive anemia; i. e., how many showed a decrease in their hemoglobin estimate during the latter months of pregnancy, rather than an improvement?

In the analysis of the work done on these 200 women, no blood examinations made before the twenty-eighth week of pregnancy have been included—all the figures apply to the third trimester. No cases have been included in which there was vaginal bleeding during pregnancy or labor, nor any cases in which there was a chronic condition, such as tuberculosis. All the patients were supposedly normal women. So far no cases of pernicious anemia have been found. All were secondary in type.

TABLE 1.—*Ages of Patients Studied*

Years	Cases
17–20	23
21–25	60
26–30	65
31–35	38
36–40	7
41–45	7
	200

ANEMIA AT TERM

Of the 200 patients studied, 156 had had blood examinations at the fortieth week of pregnancy, and twenty-one between thirty-eight and forty weeks, making a total of 177 who had had counts made approximately at term. This leaves twenty-three who had their last examination prior to the thirty-eighth week of pregnancy. In the 177 women examined at term the average hemoglobin was 75.3 per cent, with extreme variations of red blood count 3,200,000, hemoglobin 50 per cent, and red blood count 4,600,000, hemoglobin 95 per cent. When these patients were grouped according to their hemoglobin estimates, the answer to the first question became apparent, as can readily be seen in table 2.

TABLE 2.—*Blood Count in One Hundred and Seventy-Seven Women Examined at Term*

Hemoglobin, Per Cent	Average Red Blood Cell Count	Cases	Percentage
Over 90	4,326,000	3	1.70
86–90	4,488,000	15	8.47
81–85	4,224,000	22	12.43
76–80	4,150,000	40	22.60
71–75	3,842,000	40	22.60
70 or below	3,514,000	57	32.20
Total		177	100.00

That fifty-seven out of 177 patients reached term with a hemoglobin of 70 per cent or below is so startling and the percentage of these cases (32.2) is so high that I have made a most careful study of the entire work done so far. Although realizing that some anemia was to be anticipated late in pregnancy, and that the associated hydremia at this time might give rise to a relative anemia, I had not looked for a group of so many cases with a low hemoglobin. Kerwin and Collins [1] in 1926 found 15.1 per cent in a series of eighty-six patients who showed a hemoglobin of 70 per cent or below during the last trimester.

A careful search of both the American and the foreign literature has so far failed to reveal other series

* From the clinic of the Woman's Hospital.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 13, 1928.

1. Kerwin, William; and Collins, Lisle: Hemoglobin Estimates in Pregnancy, Am. J. M. Sc. **172**: 548-583 (Oct.) 1926.

of cases with which a comparison could be made. Such undoubtedly exist, but I have not been fortunate in locating them.

Among the authors of recent textbooks on obstetrics, Polak [2] is the only one who throws much light on this subject. He says in his second edition: "The anemia which is *characteristic* in the *latter months of pregnancy* may become *so exaggerated* as to *appear pernicious*. The hemoglobin may fall to 30 per cent, and the red blood cells be diminished to 1,600,000." (The italics are his.)

In analyzing our 200 cases I found that, in addition to the fifty-seven women who at term had a hemoglobin of 70 per cent or below, there were nineteen others who some time during the last trimester of their pregnancy had a hemoglobin of 70 per cent or less. This makes a total of seventy-six patients who showed this degree of anemia some time late in pregnancy, or an incidence of 38 per cent, which would tend to support the previous figure of 32.2 per cent who reached term with so low a hemoglobin. I have wondered whether there might be a common associated condition in these patients to account for this high incidence; whether many had toxemia or syphilis, or whether many gave a history of frequent child bearing. In a study of these seventy-six patients who some time late in pregnancy showed this anemia, only ten were found who had

TABLE 3.—*Relation of Toxemia and Syphilis to Hemoglobin Percentage*

	Two Hundred Cases Studied		Seventy-Six Cases with Hemoglobin 70 Per Cent or Less	
	Number	Per Cent	Number	Per Cent
Toxemia	27	13.5	10	13.0
Syphilis	2	1.0	0	0.0
Primiparas	131	65.5	55	72.3
Secundiparas	24	12.0	11	14.4

symptoms of toxemia, or 13 per cent, and none whose Wassermann reactions were positive. As to frequent pregnancies, fifty-five were primiparas and eleven had had only one child previously. Table 3 gives these statistics in concise form. Conversely, among the 200 cases studied there were in all twenty-seven cases of toxemia, and in ten of these during the last twelve weeks of pregnancy there was hemoglobin of 70 per cent or less. In regard to syphilis there were only two patients with a positive Wassermann reaction and the hemoglobin in both these women was 75 per cent.

Our series so far would suggest that neither the incidence of toxemia nor that of syphilis was sufficiently frequent among the patients showing an anemia to be an important factor. However, the incidence of anemia among those with toxemia is significant, and coincides with the accepted teachings on this subject. Repeated pregnancies were not an important factor in this small series, as among these seventy-six patients there were fifty-five giving birth to their first child and eleven to their second.

Realizing that with a series giving such striking percentages as this study has shown there must be a control group for comparison, before really valuable deductions can be drawn, I have undertaken to work out such a control. Data have been tabulated in a group of 100 consecutive ward patients with retroversions from the surgical service, and a study has been made of the blood counts done on the admission of these patients to the hospital. None of them were pregnant. All patients with such associated conditions as myomas, polyp, salpingitis, ovarian cyst or appendicitis have been omitted. This series covers the period from October, 1926, to April, 1928. The red cell counts and the hemoglobin estimates were done in the same manner by the laboratory technicians and the junior interns as in the other series, and throughout the Sahli hemoglobinometer was used. When these patients were grouped according to their hemoglobin estimates, similarly to the series of

TABLE 4.—*Blood Counts in One Hundred Control Cases of Retroversion*

Hemoglobin, Per Cent	Average Red Blood Cell Count	Number of Cases
Over 90	4,450,000	1
86–90	4,503,000	6
81–85	4,481,000	16
76–80	4,162,000	28
71–75	4,113,000	17
70 or less	3,614,000	32
		100

177 patients studied at term, there were disclosed some most interesting figures (table 4).

If this table is compared with table 2, it will be seen that the percentage of cases showing a hemoglobin of 70 per cent or less remains identical in the two series. However, the average red cell count runs a little higher throughout in the control series. Table 5 shows this comparison.

From this it would seem that the high incidence of anemia in late pregnancy which has been found is not necessarily caused by or dependent on the pregnancy per se but may to a considerable degree represent a preexisting anemia associated with pregnancy. I am now centering my attention, therefore, on those cases which in the third trimester of pregnancy show a progressive fall in hemoglobin, feeling that these are really the ones which should be grouped as anemias of pregnancy. This leads to a consideration of the second question.

TABLE 5.—*Comparison of Hemoglobin Percentage in Pregnant Women and Controls*

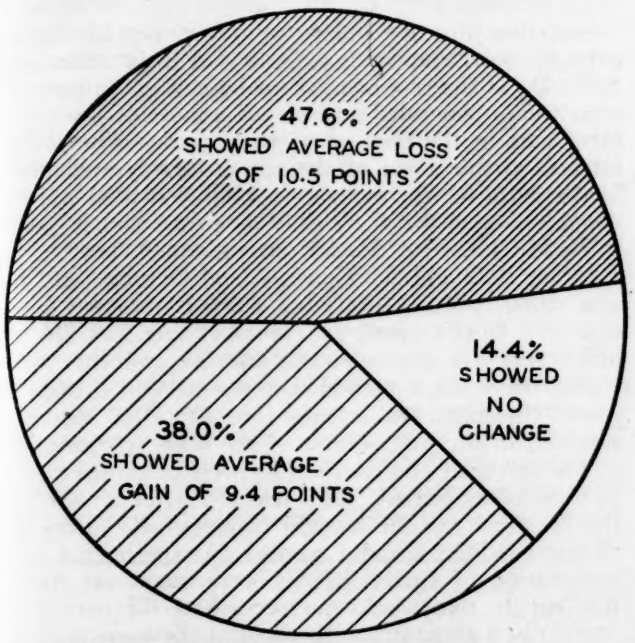
Hemoglobin, Per Cent	Series of 177 Women at Term		Series of 100 Women with Retroversions	
	Number	Per Cent	Number	Per Cent
Over 90	3	1.70	1	1
86–90	15	8.47	6	6
81–85	22	12.43	16	16
76–80	40	22.60	28	28
71–75	40	22.60	17	17
70 or below	57	32.20	32	32
	177		100	

PROGRESSIVE ANEMIA

Among these 200 patients there were thirty-five who had had three red cell and hemoglobin estimates made during the last twelve weeks of pregnancy. These counts were done as nearly as possible at monthly intervals. There were also twenty-seven women who had two counts made during this time, but in order to simplify the tables only seven of these have been considered; viz., those who had blood counts at the beginning and at the end of the third trimester. This gives forty-two patients for study. None of these were under any treatment for anemia during this time. There were two main groups, one containing sixteen

2. Polak, J. O.: Manual of Obstetrics, ed. 2, New York, Physicians and Surgeons Book Company, 1922.

patients, or thirty-eight per cent, who showed a gain in hemoglobin during the third trimester (the average gain being 9.4 points), and the other containing twenty patients, or 47.6 per cent, in whom the hemoglobin fell (the average loss being 10.5 points). There was a third smaller group of six cases which did not show any change. The accompanying illustration shows these groups graphically. The facts that there were twenty patients in whom the hemoglobin was less at the end of the third trimester than at the beginning, and that twelve of these twenty patients reached the end of their pregnancy with a hemoglobin of 70 or less are certainly significant. Although a series of forty-two is a small one, and percentages will undoubtedly be changed by a larger group of cases, still from the observations we certainly are justified in watching all prenatal clinic patients most carefully, and in having the necessary blood examinations made to determine, first, which patients are anemic, and, secondly, which show a progressive loss in hemoglobin late in pregnancy.



Progressive changes in hemoglobin in forty-two cases.

This study so far has shown that anemia late in pregnancy is a real and frequently occurring condition and should be watched for. If seventy-six out of 200 patients (38 per cent) have a hemoglobin of 70 per cent or less some time during the third trimester, and fifty-seven out of 177 patients at term (32.2 per cent) have this low hemoglobin, we must be on the alert if we are to do our full duty by these patients. Is not a woman with this degree of anemia a poor risk? Surely she cannot be expected to withstand a prolonged labor or a difficult delivery so well as one who has a normal blood picture, nor can she tolerate much loss of blood without symptoms developing. A close correlation between the prenatal clinic and the inside ward service in the hospital caring for obstetric patients will permit of a more careful study and follow-up of these cases. Routine hemoglobin estimates will prove of the greatest value in this work and will help materially in insuring that the maximum number of clinic patients reach the delivery room as good surgical risks.

SUMMARY

This study of anemia in late pregnancy is based on blood counts taken during the third trimester of pregnancy in 200 cases from the obstetric division of the Woman's Hospital.

1. Among these 200 patients, 125 were between the ages of 21 and 30 years; 131 were primiparas; twenty-seven showed symptoms of toxemia, and two had positive Wassermann reactions.

2. There were 177 cases in which examination was made at term. The average hemoglobin of this group was 75.3 per cent.

3. Among these 177 patients who were examined at term there were fifty-seven whose hemoglobin was 70 per cent or less; i. e., 32.2 per cent approached their labors with an undesirably low hemoglobin.

4. Among the 200 cases there were seventy-six in which sometime during the third trimester there was a hemoglobin of 70 per cent or less. Ten of these (13 per cent) had a toxemia; none had syphilis; fifty-five (72.3 per cent) were primiparas, and eleven (14.4 per cent) had borne only one child previously.

5. A control series of 100 nonpregnant women with retroversions showed an incidence of 32 per cent who had a hemoglobin of 70 per cent or less on admission to the surgical wards.

6. Of these 200 patients, forty-two had repeated blood counts during the third trimester; sixteen of these (38 per cent) showed a gain in hemoglobin and twenty (47.6 per cent) showed a fall in hemoglobin. Of the twenty with a falling hemoglobin, twelve reached term with a hemoglobin of 70 per cent or less.

7. Every patient is entitled to reach term and enter her labor in the best possible condition. Careful prenatal study of each patient can best accomplish this.

8. A prenatal clinic which is closely correlated with the inside ward service is essential to every hospital caring for obstetric patients.

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ABSTRACT OF DISCUSSION

DR. GEORGE GRAY WARD, New York: I wish to stress the importance of this subject as a necessary part of all prenatal work. Very often it is overlooked, and it is necessary to be just as careful in the prophylactic care of the obstetric patient as of the gynecologic or surgical patient, so far as making a study of the blood picture before the onset of labor is concerned. That means, therefore, that one should also be sure that all patients who come to term with a degree of anemia lower than normal should be prepared by having the necessary typing done so as to save time should there be a hemorrhage at the time of labor. Likewise, blood transfusion should be ready for all patients who may possibly have to stand a severe loss and who have a preexisting anemia. That means that such patients are best treated in the hospitals. Fortunately, women are becoming educated, so that most of them are confined in hospitals, in the large cities at least. The intern staff should be trained in typing and matching the blood so that when these conditions occur, usually as emergencies, there will be no delay and the patients can be taken care of promptly, even though it is on a Saturday or a holiday, when the laboratory is closed.

DR. CARL HENRY DAVIS, Milwaukee: From time to time a real anemia of pregnancy is seen. I recently had two patients in whom the hemoglobin was under 50 per cent during the major portion of pregnancy in spite of treatment. With one of these we tried various procedures, such as giving spleen marrow and iron, but without much improvement. The other patient was given large doses of liver extract throughout pregnancy, and the hemoglobin and red blood cell count gradually declined until at the beginning of the last month the hemoglobin was 30 per cent and the red cell count was approximately 3,000,000. As the effect of this anemia on the baby was feared, the patient was given 450 cc. of whole blood. Shortly after the transfusion, the patient went into labor and the following

morning she was delivered. The blood count immediately after delivery was approximately the same as the blood count after the transfusion. The other patient had a hemoglobin of approximately 50 per cent at the time of delivery. Both these patients were in group III and both the babies were in group I. Whether there is any relation between the blood grouping of the baby and that of the mother remains for future determination. Both patients were given a type of treatment that is being used experimentally, and when they left the hospital at the end of two weeks, both had a hemoglobin of 70 per cent, or a little more, and in both instances the red cell count was more than 5,000,000. Three years ago I had a series of approximately fifty cases in which the counts were made at the end of pregnancy and after delivery. Some of these patients were placed on spleen marrow and others were not given anything during the puerperium, and it was found that with few exceptions all the patients showed very definite increases in the hemoglobin and the red cells during the puerperium. This led me to believe that some of the anemia late in pregnancy has to do with the increased volume and the dilution of the blood.

DR. CHARLES EDWIN GALLOWAY, Evanston, Ill.: In the last two years I have been studying anemia in connection with pregnancy and the puerperium and at the present time have data on about 241 cases. I find that Dr. Lyon's figures obtained from examinations in the third trimester are practically the same as my own. I have also found that the same tendency to anemia exists in the first and second trimesters of pregnancy. I believe that pregnancy has something to do with the anemia regardless of the fact that Dr. Lyon has seen corresponding cases of simple retroversion. I have found, as have also other investigators, that the anemia of the average patient corrects itself almost entirely within the first fourteen days following delivery. Another reason why pregnancy seems to be the cause is that the same women, when not pregnant, do not show any anemia. I wrote to seventy-five of my patients and forty of them responded, coming back to the office about six months after they had been delivered. The blood counts in these forty patients averaged 85 per cent hemoglobin and 4,710,000 red blood cells. The average counts at the present time are 72 per cent hemoglobin for the first trimester, 70 for the second and 71 for the third. I do find a number of severe anemias in the last trimester of pregnancy but I do not think that the condition is anything to be alarmed at. I have not been able to prove that the delivery and the puerperium of patients who have been severely anemic are any different from those of other patients. Paul Kuhnel, a German, studied fifteen normal pregnant women, taking a hemoglobin estimation, a red cell count and a volume percentage every two weeks during the prenatal period and for six months post partum, and the volume percentage corresponded to the hemoglobin and red cell count, showing no change with delivery. I think that these results help to prove that the condition is a true anemia.

DR. JOSEPH L. BAER, Chicago: Whatever the source of the crisis in pregnancy or labor that results in acute blood loss, the obvious remedy today is blood transfusion. As Dr. Ward pointed out, patients should be typed prophylactically so that there is an immediate availability of the correct donor for the given patient. At the Michael Reese Hospital in Chicago, literally hundreds of blood transfusions are carried out comparatively uneventfully each year. Two cases, however, were of interest: one was a case of premature separation of the placenta with considerable loss of blood; the other was a case of difficult low cervical section, likewise with considerable blood loss. In each case the donor was type I, the so-called universal donor. The recipient was type II. The typing was done by the expert in the laboratory and the technic was carried out accurately. Afterward, following two near catastrophes, the serums, which had been saved, were rechecked and were again found to be entirely compatible. Both these patients sustained a very severe foreign protein shock reaction within from five to thirty minutes, exhibiting backache, cyanosis, pulselessness, severe chill, a temperature of from 103 to 104 F., with, for a few hours, the picture of impending death. Fortunately, both recovered. The impression we had was that it is perhaps wiser to use as a donor only some one from the same group as the recipient and to discard the availability of the so-called universal donor.

DR. EDWARD C. LYON, JR., New York: I thoroughly agree with the importance of transfusion and the preparation of the patient for transfusion. One should always be ready to give the transfusion in the necessary cases. We have started following the blood picture during the puerperium, but we are not ready to report on our results. We have been making postpartum blood counts for several months, but have not yet accumulated sufficient data for a report.

COLLOIDAL LEAD WITH HIGH VOLTAGE ROENTGEN THERAPY IN MALIGNANT DISEASE

REPORT OF CASES *

CHARLES A. WATERS, M.D.
J. A. C. COLSTON, M.D.
AND
LESLIE N. GAY, M.D.
BALTIMORE

Since the time of Goulard, who first used his famous extract, now known as solution of lead subacetate, U. S. P., in the treatment of malignant growths, heavy metals and their salts have played a more or less prominent part in the therapy of such cases. The present interest in this form of therapy is largely attributable to the work of Torres, who in 1904 first used colloidal metals. Later, the work of Wasserman and Keysser [1] in 1911, Kausch,[2] Loeb [3] and Goube [4] later, Blair Bell [5] in 1922 and subsequently, and Deroux,[6] in 1924, stimulated renewed efforts on the part of many investigators. In this country the work of Wood,[7] Ullmann [8] and others has aroused much interest, and their publications have made possible the use of lead therapy by many clinicians not equipped to carry on elemental research in the preparation of the necessary solutions.

The solutions and methods of preparation used in the present investigations were adopted after a search of the literature for the method most suitable to the prevailing conditions, and a number of experiments in the preparation of such solutions were made. A method was sought that would not necessitate the use of any complicated apparatus and would at the same time give solutions of reasonably uniform strength and maximum stability. The method of Telkes [9] gives solutions of a maximum content of only 0.2 per cent and in addition requires much complicated apparatus. The method of Bischoff and Blatherwick [10] requires such high voltage as not to be practical in our work, such high voltages not being available. Other methods which deserve mention are those of Stenström and Reinhard [11] and Helen Woodward,[12] whose preparation was used by Stone and Craver [13] in the treatment of about twenty cases.

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* Read before the Section on Radiology at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 14, 1928.

1. Wasserman and Keysser: Deutsche med. Wchnschr. **37**: 2389 (Dec. 21) 1911.
2. Kausch: Arch. f. klin. Chir. **102**: 159, 1913.
3. Loeb: Interstate M. J. **19**: 1015, 1912.
4. Goube: La cuprasse et le cancer, Paris, 1913.
5. Bell, W. B.: Lancet **2**: 1005, 1912; **1**: 267 (Feb. 9) 1924. Bell, W. B., and others: Ibid. **1**: 537 (March 13) 1926.
6. Deroux: Les cancers, Paris, Masson & Cie, 1924.
7. Wood, F. C.: Use of Colloidal Lead in the Treatment of Cancer, J. A. M. A. **87**: 717 (Sept. 4) 1926; Effects of Combined Radiation and Lead Therapy, ibid. **89**: 1216 (Oct. 8) 1927.
8. Ullmann, H. J.: The Combination of Colloidal Lead and Irradiation in Cancer Therapy, J. A. M. A. **89**: 1218 (Oct. 8) 1927. Ullmann, H. J., and others: Radiology **8**: 461 (June) 1927.
9. Telkes: J. Am. Chem. Soc. **49**: 1382 (May) 1927.
10. Bischoff, F., and Blatherwick, N. R.: J. Pharmacol. & Exper. Therap. **31**: 1-27 (May) 1927.
11. Stenström, N. G., and Reinhard, M.: J. Biol. Chem. **69**: 607 (Aug.) 1926.
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13. Stone, W. S., and Craver, L. F.: Ann. Surg. **86**: 347 (Sept.) 1927.

The method finally adopted by us in preparing these solutions is essentially the method used by Bell [5] and by Francis Carter Wood [7] at Columbia. It was through the courtesy and cooperation of Dr. Wood that we were able to begin our experiments and our final solution differs little from his. The method used is based on the methods of Bredig [14] and consists mainly in stirring a suspension of coarse lead particles in a suitable medium with lead electrodes. The apparatus used by us and shown in figure 1 consisted of two lead electrodes about one-half inch thick and 6 inches long attached by means of "battery clamps" to a circuit consisting of five 5-ampere resistance units and a 40 watt light connected in parallel and a two pole switch. This apparatus has been used on the regular 110 to 120 watt lighting circuit in which special fuses have been placed capable of carrying the 30 to 35 amperes necessary. The lead electrodes were made by melting pure silver-free lead obtained from Eimer and Amend. This lead was used throughout in all our work. The coarse lead to be sparked was prepared by melting a sufficient quantity of lead and quickly pouring it into cold water. The medium in which this lead was suspended for sparking consisted of 500 cc. of a sterile solution of 0.4 per cent gelatin and 0.027 per cent calcium chloride. This solution is identical with that used by Bell.[5] The gelatin serves as a protective colloid and the calcium chloride has the usual stabilizing effect of small amounts of electrolyte on such solutions.[15] It has been our experience that some such electrolyte is essential for a stable solution.

Sparking is carried out by stirring the coarse lead with the lead electrodes for a period of from fifteen to twenty minutes. The solution heats up, and it is necessary that the container be placed in a freezing mixture to prevent more rapid oxidation of the lead at the somewhat higher temperature. When sparking is finished the solution is poured into a sterile flask containing 250 Gm. of dextrose and 5 Gm. of salt and saturated with a current of nitrogen to remove the ozone formed

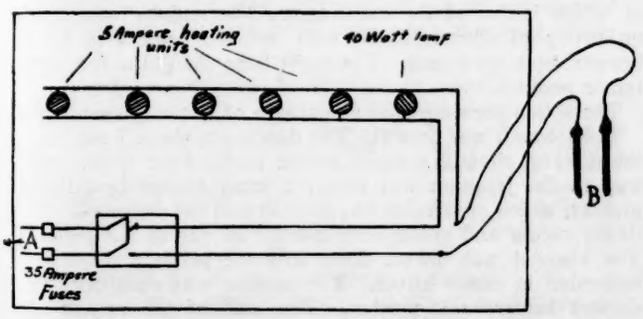

Fig. 1.—High voltage apparatus for the preparation of the colloidal lead solutions used in the treatment of carcinoma: *A*, to 110 volt alternating current lighting circuit; *B*, pure lead electrodes.

in the sparking as well as air, both of which hasten the precipitation of the lead by oxidation to lead oxide and carbonate. The purpose of the dextrose is to increase the stability of the solution, which it undoubtedly does. A number of experiments have proved that solutions of colloidal lead to which dextrose has been added after sparking keep much longer than those which do not contain dextrose. The addition of dextrose to the solution before sparking did not seem to have any appreciable effect, possibly because of its degradation by the spark. Its stabilizing action may be due to any of several factors, as inhibition of oxidation, increase in viscosity, or alterations of electrocharge on the lead particles through adsorption. In addition to its stabilizing effect it seems to lower the toxicity of the lead colloid, rabbits having repeatedly tolerated amounts of lead in dextrose solution which proved lethal in solutions that did not contain dextrose. Several rabbits have tolerated doses greater than 15 mg. of lead per kilogram of body weight. In support of this action by dextrose, the work of Redewill, Potter and Garrison [16] and of Macht and Harden [17] on the effect of dextrose in lowering the toxicity of mercurochrome may be mentioned. In addition to the lowering of toxicity, the dextrose may have other beneficial effects in such therapy, as suggested by the work of Pfahler and Widmann.[18] After saturation with nitrogen, the solution is poured into sterile 100 cc. centrifuge tubes and centrifugated for from three to five minutes to remove the larger particles. It is then transferred to an ampule filling device (fig. 2) and poured into 20 cc. sterile ampules. These ampules are alternately evacuated and flushed with nitrogen and sealed under an atmosphere of nitrogen. Solutions prepared in this manner have been kept for several months without any apparent increase in toxicity. Solutions as old as 21 days have been used clinically without untoward results. The strength of the solution is determined by dissolving the colloid in acetic acid, precipitating with potassium dichromate solution, dissolving the precipitate in hydrochloric acid, adding potassium iodide, and titrating the iodine liberated with hundredth-normal sodium thiosulphate. This method has been described in detail by Bischoff and Blatherwick.[10]

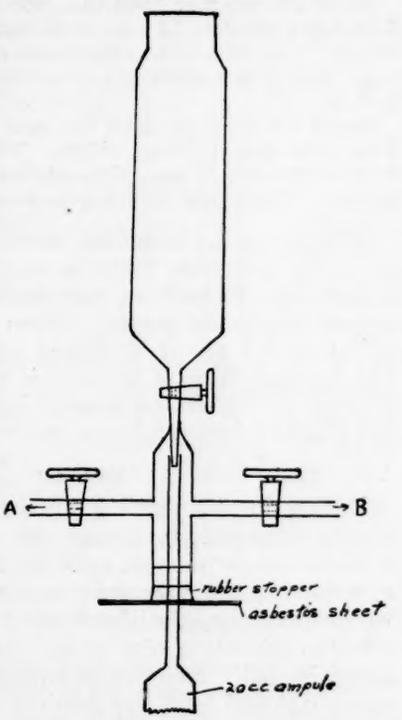

Fig. 2.—Apparatus used for the saturation of the lead solution with nitrogen prior to putting it up in 20 cc. ampules: *A*, to nitrogen tank; *B*, to vacuum line.

TOXICITY OF COLLOIDAL LEAD SOLUTIONS

The toxicity of these solutions for laboratory animals seems to vary considerably. This is in accordance with the observations of other investigators. Animals have repeatedly withstood injections of 15 mg. of lead per kilogram of body weight, while the minimum lethal dose seems to be in the neighborhood of 20 mg. Several typical examples follow:

Rabbit 468, weighing 1,120 Gm., was given 7 cc. of a solution containing 3.4 mg. of lead per cubic centimeter, about 21 mg.

14. Bredig: Ztschr. f. Elektrochem. **4**: 514. Ztschr. f. phys. Chem. **31**: 258.
15. Rossi and Marescotti: Ann. Chim. Aplicata **17**: 167, 1927.
16. Redewill, F. H.; Potter, J. E., and Garrison, H. A.: J. Urol. **16**: 397 (Nov.) 1926.
17. Macht, D. I., and Harden, W. C.: J. Pharmacol. & Exper. Therap. **32**: 321 (March) 1928.
18. Pfahler, G. E., and Widmann, B. P.: Value of Intravenous Injections of Dextrose, J. A. M. A. **89**: 1492 (Oct. 29) 1927.

per kilogram of body weight, June 23, 1927. Two months after injection this rabbit was in good health but had lost considerable weight.

Rabbit 474, weighing 2,500 Gm., was given a dose of 7.2 cc. of the solution in which 1 cc. contained 5.9 mg. of lead. This corresponds to about 21 mg. per kilogram of body weight. The rabbit died in one hour.

Rabbit 2, weighing 1,920 Gm., was given a dose of 6.2 cc., 1 cc. being equal to 5.9 mg. of lead. The rabbit died after several days.

Rabbit 20, weighing 1,940 Gm., was given a dose of 10 cc., 1 cc. being equal to 3.7 mg., or 21 mg. per kilogram of body weight. This solution was two weeks old at the time of injection. One month after injection the rabbit was alive and healthy.

Rabbit 470, weighing 2,200 Gm., was given a dose of 12 cc., 1 cc. being equal to 5 mg. of lead. The dose per kilogram of body weight was 21 mg. This solution was 35 days old when injected. The animal did not show any toxic effects.

No attempt has been made to sterilize these solutions, since they are made under as nearly aseptic conditions as possible. In addition, they have been shown to have a weak germicidal power. When 0.1 cc. of culture is added to 0.5 cc. of undiluted colloidal lead solution (H. L. test) *Bacillus typhosus* is not killed in five minutes but is killed in ten minutes. *Micrococcus aureus* is not killed in fifteen minutes under the same conditions.

THE CLINICAL USE OF LEAD THERAPY

During the past year seven patients showing on examination inoperable malignant tumors have been treated with the preparation of colloidal lead. From the first examination the prognosis was clearly hopeless, and without exception the life of each person was considered a matter of only a few weeks. However, in combination with daily roentgen treatment over the malignant areas, colloidal lead was administered intravenously; a dose of 50 mg. was given at weekly intervals. The following are brief protocols of the cases:

REPORT OF CASES

CASE 1.—*Inoperable round cell sarcoma of the bones of the pelvis, probably arising from the ischium and involving the rectum and bladder with metastases to the lungs.*

History.—A man, seen in June, 1925, complained of pain radiating down the right sciatic nerve. On rectal examination a mass was found extending from the right side of the pelvis to but not involving the prostate. At operation this mass was removed as completely as possible and was found to involve the right ischium. Microscopic study of the section showed round cell sarcoma. During his postoperative convalescence, the patient was given a thorough course of radium and high voltage roentgen therapy. During the following year he remained in comparatively good condition. There was no evidence of metastasis. On rectal examination a mass could still be felt, but it was never certain whether this was tumor or simply postoperative scar tissue.

The patient returned in September, 1926, at which time the symptoms of pain down the right thigh and in the pelvis were present. On examination it was found that the mass had evidently increased in size and was encroaching on the prostate. He was again given several local applications of radium with considerable improvement in the symptoms. He returned in December, 1926, with recurrence of pain, loss of weight and pallor. Roentgen examination (fig. 3) at this time showed typical lung metastases, and on rectal examination there was further progress of the pelvic mass. He was treated by extensive roentgen therapy and his condition improved markedly. A roentgenogram (fig. 4) taken in January, 1927, showed that the lung metastases had completely disappeared.

The patient remained in fairly good condition throughout the spring and summer but returned in June, 1927, complaining of pain and showing evidence of progressive cachexia. Examination showed further enlargement of the pelvic mass, which now had invaded the wall of the rectum, and there was fixation of all the pelvic viscera. From June until August he was given intravenous injections of colloidal lead, 50 mg. in each dose, together with numerous high voltage roentgen treatments. Before therapy, hemoglobin was 70 per cent, white blood cells 10,000, red blood cells 4,024,000. Two transfusions of 500 cc. of blood were given during the course of the lead therapy. The lowest hemoglobin reading was 60 per cent. After treatment was completed, hemoglobin was 68 per cent, white blood cells 10,900, and red blood cells 4,500,000. There was no evidence of lead poisoning and no stippling of the blood cells. A short remission in the progress of the tumor was noted, but the patient became progressively worse and a rectovesical fistula developed. He died, Nov. 11, 1927, the hemoglobin falling to 26 per cent and the red cells to 2,106,000.

Autopsy.—A complete autopsy was obtained. An anatomic diagnosis was made of round cell sarcoma in the right ischiorectal fossa and infiltrating the pelvic tissue and bone, extensive necrosis of the right ischium, metastases in the lungs and jejunum, rectovesical fistula, diphtheritic proctitis and cystitis, right pyonephrosis, bilateral pyelonephritis, acute splenic tumor, acute fibrinous pelvic peritonitis, serosanguineous pleurisy, decubitus ulcer, secondary anemia, and ulcer of the duodenum.

The body showed extreme emaciation, with absence of omental and mesenteric adipose tissue. The skin and mucous membranes were of a striking pallor. The peritoneal cavity contained 200 cc. of thin, clear fluid. In the pelvis the organs were closely matted together by old adhesions. The sigmoid was drawn down into the pelvis and firmly embedded in the dense tissue filling the pelvis. The right ischiorectal fossa was lined by a thick layer of dense grayish, semitranslucent tumor tissue, which was closely adherent to the sacrum, ischium and pubis and which infiltrated the pelvic muscles and nerves as well as the walls of the bladder and rectum. The right ischium was invaded by tumor and was necrotic. The appearance was thus one of sarcoma, arising presumably from the periosteum or bony substance of the right ischium, causing extensive necrosis of the bones and infiltrating practically all the tissues of the pelvis.

The right sciatic nerve was found embedded in tumor. The presence of the extensive fibrosis and scarring was probably due to the treatment by x-rays and radium.

The heart was essentially normal. Both pleural cavities contained a small amount of thin reddish fluid.

The left lung showed several large metastatic nodules, one of which infiltrated the diaphragm. The nodules were made up partly of fibrous tissue with necrotic centers in which hemorrhages were seen. The right lung showed a few small tumor nodules.

The spleen presented the appearance of acute splenic tumor.

The stomach was normal. The duodenum, about 1 cm. below the pylorus, showed a small, round, punched-out ulcer. Midway in the jejunum was found a small nodule beneath the mucosa, which on section was grayish and homogeneous. The ileum, cecum and colon were normal as far as the sigmoid. The sigmoid was drawn down into the pelvis and partially embedded in tumor tissue. The mucosa was roughened and showed hemorrhagic patches. The wall of the rectum was thickened by tumor tissue and the mucosa presented intense diphtheritic inflammation with large areas of grayish brown necrotic exudate. There was a large opening between the anterior wall of the rectum and the posterior wall of the bladder in the region of the trigon.

The pancreas was normal.

The liver and the suprarenals were essentially normal.

The left kidney was large, soft and swollen; the surface was mottled with hemorrhagic areas. The pelvis showed an extensive diphtheritic hemorrhagic inflammation. The ureter was moderately dilated, the orifice opening into the necrotic tissue at the border of the rectovesical fistula. The right kidney was about normal in size. Removal of the capsule revealed several large necrotic abscesses, and the pelvis showed a large amount of creamy pus, the kidney tissue being largely necrotic with many abscesses and many opaque yellow streaks.

The bladder was small, a large part of its posterior portion having formed a fistula into the rectum. The mucosa showed an intense diphtheritic hemorrhagic inflammation.

The prostate was very small and scarcely recognizable, being embedded in dense scar tissue lining the pelvis.

The testes were normal.

The neck organs did not show any significant changes. The aorta was smooth and elastic. The skeletal muscles were atrophic and pale. The right psoas muscle showed a bluish black discoloration above the pelvis. In the pelvis it was infiltrated with tumor tissue.

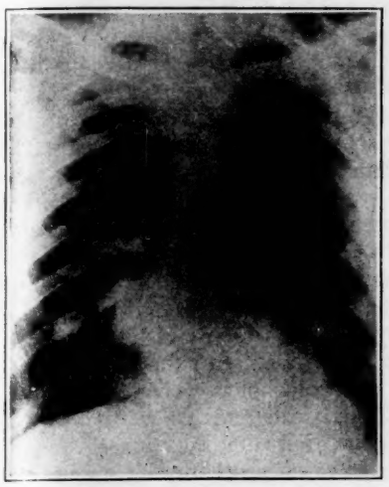

Fig. 3 (case 3).—Extensive pulmonary metastases eighteen months after operation.

The bone marrow of the femur was pale and aplastic in appearance, and it showed some opaque yellow masses which might possibly have been tumor metastases.

Brain and cord examination was not permitted.

Microscopic Examination.—The heart was normal.

In the lung a section of the metastatic nodule showed some necrosis and hemorrhage and there was hemorrhage or edema in the surrounding lung. The tumor tissue was made up of round cells slightly larger than small lymphocytes, with paler, somewhat vesicular, nuclei and a very small amount of cytoplasm. Occasionally mitotic figures were seen.

There was moderate central atrophy with fatty infiltration in the liver.

The kidneys showed well marked pyelonephritis with tubules dilated and filled with leukocytes, and at one end of the section were several large abscesses and areas of necrosis.

The pancreas, testes, suprarenals and thyroid were normal.

The marrow spaces of the right ischium were replaced by round cell tissue, large parts of which were necrotic. In one place there was a new formation of loose fibrous tissue. The tissue lining the pelvis was composed mainly of dense, hard scar tissue, in which nerves, blood vessels and atrophied muscle fibers were embedded. A few small areas of tumor tissue were found. The extreme scarring was probably the result of roentgen and radium treatment. In the rectum the mucosa was largely necrotic and was covered in places with diphtheritic exudate. The small subcutaneous nodule in the jejunum was composed of sarcoma tissue infiltrating the muscle layer and obviously was highly malignant. The retroperitoneal lymph nodes did not show metastases.

TABLE 1.—*Blood Morphology in Case 2*

Date		Hemoglobin (Sahli) Per Cent	White Blood Cells	Red Blood Cells
7/14/27	Before lead therapy.....	70	14,100	4,300,000
11/ 3/27	After lead therapy.....	60	20,000	3,050,000

TABLE 2.—*Blood Morphology in Case 3*

Date		Hemoglobin (Sahli) Per Cent	White Blood Cells	Red Blood Cells
1/31/27	Before lead therapy.....	80	8,600	4,800,000
2/27/27	After lead therapy.....	80	2,950	4,000,000

This case presented a tumor of highly malignant nature which was apparently controlled over a period of a year by radium and high voltage roentgen therapy. The astonishing disappearance of pulmonary metastases under high voltage roentgen therapy was most interesting and the original tumor was also definitely inhibited in its growth, as shown by the intense scarring noted in the pelvis. In spite of this definitely favorable response to therapeutic efforts, the disease process slowly continued and was apparently uninfluenced by the lead injections.

CASE 2.—*Inoperable carcinoma of the fundus of the uterus and pelvis.*

In this case seven lead treatments, a total of 350 mg., were given with numerous roentgen treatments.

Two transfusions of 500 cc. each were required. There was no stippling, but the patient developed a sore mouth with loose teeth and a definite lead line.

TABLE 3.—*Blood Morphology in Case 4*

Date		Hemoglobin (Sahli) Per Cent	White Blood Cells	Red Blood Cells
6/27/27	Before lead therapy.....	65	9,600	3,660,000
7/26/27	After lead therapy.....	46	12,600	3,400,000

TABLE 4.—*Blood Morphology in Case 5*

Date		Hemoglobin (Sahli) Per Cent	White Blood Cells	Red Blood Cells
10/20/27	Before lead therapy.....	80	5,200	4,032,000
5/ 7/28	After lead therapy.....	90	5,000	4,480,000

Death occurred in December, after a short remission in the progress of the tumor.

CASE 3.—*Inoperable tumor of retroperitoneal glands.*

In this case three lead treatments were given, a total lead dosage of 150 mg.

The patient is still living, but is in a state of extreme emaciation. The tumor cannot be felt at the present time.

CASE 4.—*Inoperable carcinoma of the prostate.*

Six lead treatments were given in this case.

The patient died after the treatment and autopsy could not be obtained.

CASE 5.—*Inoperable recurrent carcinoma of the breast with metastatic tumors in the cervical and inguinal glands.*

In this patient the right breast had been removed six years before. Nine lead treatments in all were given, together with roentgen therapy.

The lowest hemoglobin reading was 65 per cent, the highest, 90 per cent. One transfusion of 500 cc. was given.

A lead line was present, and there was some stippling of the red cells. The treatment, however, resulted in a definite remission, with diminution in the size of the breast tumor. At present, however, metastatic glands in the right cervical region are palpable. The patient is maintaining weight and strength.

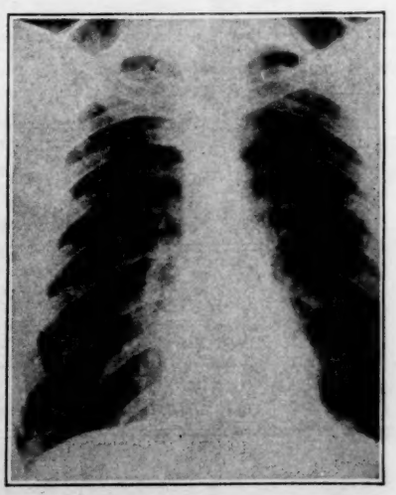

Fig. 4 (case 1).—Complete disappearance of pulmonary metastases two months after institution of high voltage roentgen therapy.

CASE 6.—*Hypernephroma of the right kidney.*

Three lead treatments were given, together with roentgen and radium therapy.

The lowest hemoglobin reading was 65 per cent, the highest, 90 per cent. One transfusion was given.

There was no stippling. The teeth were sore but a lead line did not appear.

Peripheral neuritis developed; there was no weakness but the patient complained of severe pain.

The condition is progressively worse at present, with extreme cachexia.

CASE 7.—*Sarcoma of the ribs and pleurae.*

Six lead treatments were given, together with roentgen therapy.

The lowest hemoglobin reading was 50 per cent, the highest, 78 per cent. Two transfusions of 500 cc. each were given.

The teeth were sore, and peripheral neuritis developed, but there was no stippling of the red cells.

A definite remission occurred, but at present there is extensive pulmonary involvement.

COMMENT

A second series of cases has been treated, the colloidal lead phosphate solution described by Bischoff and Blatherwick[19] being used. Through the courtesy of Dr. Ullmann of the Santa Barbara Cottage Hospital, we were able to prepare this solution, which has the advantages of being indefinitely stable[20] and considerably easier to administer.

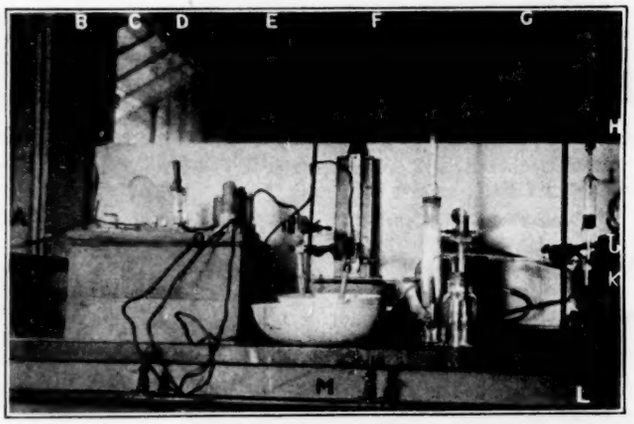

Fig. 5.—The complete apparatus for the preparation of colloidal lead solution as used by W. C. Harden, Ph.D., of Hynson, Westcott and Dunning: *A*, fuse; *B*, lamp; *C*, switch; *D*, resistance units; *E*, manometer; *F*, vacuum pump and connections; *G*, reservoir for solution; *H*, stopcock and capillary; *I*, two way stopcock to nitrogen and vacuum; *J*, microburners for sealing filled ampule; *K*, nitrogen cylinder, reducing valve and gage; *L*, half filled ampule, and *M*, lead electrodes dipping into dish containing cooled sparking solution.

During our limited experience with this method, we have given all our patients daily doses of high voltage x-rays in conjunction with weekly injections of colloidal lead. In all, fifteen patients have been treated, seven of whom have had what we feel is a full course of lead and roentgen therapy. Of these seven, four are dead and three are dying. On the other hand, we can definitely say that the tumors in most of the cases showed improvement, which, however, was promptly followed by cachexia and a rapid demise. In only one case have we given more than 300 mg. of lead. In the majority of our cases there has been some stippling; a few lead lines have been seen, and in two cases peripheral neuritis developed.

TABLE 5.—*Blood Morphology in Case 6*

Date		Hemoglobin (Sahli) Per Cent	White Blood Cells	Red Blood Cells
2/13/28	Before lead therapy.....	90	8,500	4,800,000
5/ 8/28	After lead therapy.....	75	7,600	4,350,000

TABLE 6.—*Blood Morphology in Case 7*

Date		Hemoglobin (Sahli) Per Cent	White Blood Cells	Red Blood Cells
12/28/27	Before lead therapy.....	70	4,000	3,760,000
6/ 4/28	After lead therapy.....	70	9,800	4,000,000

It has been our habit to give transfusions to our patients when the hemoglobin reached 60 per cent. We feel that it is much easier to bring about a marked improvement in the blood picture if transfusions are given before the blood is more severely destroyed.

The striking disappearance of lung metastases under deep roentgen therapy which occurred in case 1, together with the evidence of destruction of tumor tissue in the pelvis, is certainly most encouraging and undoubtedly means that we have at our disposal a very powerful agent for the destruction of tumor tissue. We can only hope that, by the refinement of technic and the further increase of our knowledge of malignant disease, we shall finally learn to destroy also the underlying process. In our experience with the short series of tumors mentioned, we could not be convinced of the beneficial effect of colloidal lead and we were inclined to attribute the transient, but definite, improvement which we noted in some cases more to the effects of high voltage roentgen therapy than to the colloidal lead.

1100 North Charles Street—Johns Hopkins Hospital—1014 St. Paul Street.

19. Bischoff, F., and Blatherwick, N. R.: J. Pharmacol. & Exper. Therap. **31**: 5-361 (Sept.) 1927.

20. Ullmann, H. J.: Surg. Gynec. Obst. **46**: 119 (Jan.) 1928.

COLLOIDAL LEAD AND IRRADIATION IN THE TREATMENT OF CANCER

REPORT OF TWO YEARS' EXPERIENCE *

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Although I have given my reasons in previous communications[1] for the use of trilead phosphate in preference to any other inorganic form of the element in the treatment of cancer, further evidence renders it advisable to recapitulate. Our chemists, Blatherwick, Bischoff and Maxwell,[2] have drawn up the following summary of their work: The toxicity of lead given intravenously depends entirely on the form of lead given. The fourteen compounds studied may be divided into four groups, when one considers the effect on the erythrocytes. The most toxic group comprises ionic lead, colloidal lead hydroxide, metallic lead, glycerophosphate, oleate and stearate. The lead hydroxide and glycerophosphate are extremely soluble. The metallic lead oxidizes to the hydroxide in the blood stream. All these compounds function potentially as ionic lead. The next most toxic group includes colloidal lead oxychloride, oxycarbonate and carbonate. These compounds are very insoluble and probably are removed from the blood stream before they have had a chance to react with the constituents of the blood. From two to four times the dose of the second group must be given to cause a drop

* Read before the Section on Radiology at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 14, 1928.

1. Ullmann, H. J.: The Use of Colloidal Lead in the Treatment of Cancer After the Method of W. Blair Bell: Preliminary Report, Radiology **8**: 461-464 (June) 1927; Combination of Colloidal Lead and Irradiation in Cancer Therapy, J. A. M. A. **89**: 1218-1222 (Oct. 8) 1927; Lead Treatment of Cancer, Surg. Gynec. Obst. **46**: 119-122 (Jan.) 1928.

2. Bischoff, Fritz; Maxwell, L. C.; Evans, R. D., and Nuzum, F. R.: Studies on the Toxicity of Various Lead Compounds Given Intravenously, J. Pharmacol. & Exper. Therap. **34**: 85-109 (Sept.) 1928.

in hemoglobin comparable to that of the first group. The third group includes tetra-ethyl lead and triethyl lead chloride. These compounds bring about only a slight drop in hemoglobin, even when the lethal dose is approached. Since the lead is linked to carbon, they are not capable of forming lead ions until hydrolysis takes

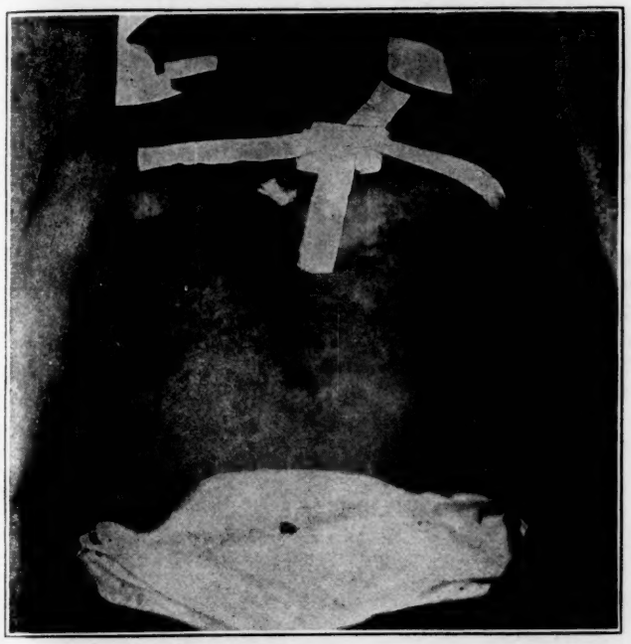

Fig. 1.—Appearance of woman with carcinoma of the breast before lead treatment was instituted. The dressings cover the biopsy wounds. The induration extended nearly to the umbilicus. Irradiation had been carried out for a long period without further regression.

place. This hydrolysis is a slow process and is probably brought about outside the blood stream. Group four comprises trilead phosphate, dilead phosphate and lead sulphide. These compounds do not have any demonstrable effect on the red cells. The dilead phosphate probably goes over to the trilead phosphate when it reaches the blood stream. Lead phosphate and sulphide are highly insoluble and are stable compounds at the p_H of the blood.

The lethal dose for a compound is difficult to evaluate because of the great variation in tolerance for different rabbits. For compounds that function potentially as ionic lead the lethal dose varies from 3 to 10 mg. of lead per kilogram of body weight. For compounds of the type of lead oxycarbonate, 16 mg. of lead per kilogram has been given without death, although 4 mg. has occasionally been fatal. The lethal dose for triethyl lead chloride is of the same order as ionic lead and that for tetra-ethyl lead the same as for lead oxycarbonate. For the pregnant animal this generalization does not hold, tetra-ethyl lead not being any more toxic and lead oxycarbonate being extremely toxic. This difference has been accounted for by the observation that lead oxycarbonate injures the liver, the organ burdened in pregnancy, and that tetra-ethyl lead does not affect the liver. The lethal dose for lead phosphate has not been ascertained, the compound apparently being without toxic effect.

Colloidal lead phosphate and ionic lead are nearly completely removed from the blood stream of the rabbit in two hours.

Colloidal lead phosphate and tetra-ethyl lead appear to be the only lead compounds suitable for trial in intravenous cancer therapy.

I am now testing tetra-ethyl lead compounds clinically and there is some evidence that they may be of value in that smaller amounts of lead appear to be required to produce the same effects as with the inorganic compounds.

The report on the clinical effects is not as encouraging as it might have been had I accepted for treatment only those with some prospect of life after a cure of their cancer. Metastases to practically every important organ were frequently found at autopsy and in several instances only a small amount of liver tissue was found. The rest of the organ was carcinoma. The report is therefore given not for statistical purposes, so far as a general evaluation of the method is concerned, but as a summation of the cases treated. I have seen sufficient action of lead on malignant tumors to warrant further trial and, as certain chemical and pathologic information has been obtained, I shall begin to limit treatment to those for whom, from my experience, I think there is a slight glimmering of hope. There is no question that, in many forms of cancer at least, lead definitely augments the effect of radiation.

On going over the case records I found it impossible to draw definite conclusions or calculate percentages without being unfair to the method on the one hand or too optimistic on the other. Last year I decided not to attempt percentage tables until a sufficient number of patients, not practically moribund, could be treated and some, at least, past the five year period. The limits of this paper prevent the giving of details on more than fifty patients but certain impressions were obtained by watching them day by day, by noting the effects seen at autopsy, and by restudying their records. These impressions are placed in the accompanying table as fractions and the size of the fraction indicates my evaluation of

Fig. 2.—Same patient at about the midperiod of lead treatment. There is marked reduction in the number and size of the nodules, and except about the nipples the skin has become flexible. Biopsy done in the center of an indurated area healed by first intention.

the method for that type of tumor so far as my experience goes. All patients are included whether they received only one injection before death or not. A very definite impression is that patients who have had lead treatments require, as a rule, much less morphine than

untreated patients in the same condition. This was first noticed by visiting physicians and brought to my attention. As all patients receive irradiation, the reduction in pain may be due to this factor alone but the amount of radiation therapy is frequently so small that I attribute the alleviation of pain largely to the lead.

The accompanying table gives a list of the patients treated and the effects observed. These effects include shrinkage, liquefaction or disappearance of the tumors as seen during life or at autopsy. Incomplete cases are those in which less than 400 mg. of lead was given. One patient refused further treatment because she thought that she was progressing so well that she had had enough. Two refused to stay longer in the hospital because they were so far from home. The largest number were those coming for treatment in a practically moribund condition, who were given one or two injections in order that the effect on the tumors might be observed at autopsy and material obtained for chemical analysis. In no case is a simple breast cancer listed. All showed many metastases. One bladder tumor is not included in this series as Dr. James Ewing did not believe it sufficiently malignant, although he thought that lead had undoubtedly been the effective sensitizing agent. It was a large, fungating, papillary growth, nearly filling the bladder, bleeding, and suppressing urination. The bladder had been opened and the bulk of the tumor scooped out, the base being left, but the surgeon considered the condition hopeless. The tumor completely disappeared under lead therapy and repeated small doses of x-rays totaling less than a full skin unit.

Effects of Treatment

Tumor	Total Cases	Effect, with Number of Each	Value Fraction
Breast	15	A-2, B-1, C-1, D-1, E-1, IB-3, IC-1, ID-1, IE-1	8/15
Cervix uteri	4	C-1, IB-2, IE-1	3/4
Malignant cystadenoma of ovary	4	B-1, E-2, ID-1	1/8
Tongue, involving tonsil (extensive)	4	D-1, E-1, ID-1, IE-1	1/8
Maxillary and submaxillary (from lip)	3	A-1, IC-1, ID-1	2/3
Bladder	3	ID-1, IE-2	1/6
Prostate	3	IC-2, IE-1	2/3
Cervical, branchiogenetic	2	C-1, IC-1	2/2
Pancreas; metastases to lungs and liver	2	C-1, ID-1	1/2
Rectum	2	ID-2	<1/2
Melanoma, generalized	2	E-1, IE-1	0
Esophagus	2	IE-1, U-1	?
Liver, primary	2	IC-1, IE-1	1/2
Stomach	2	U-2	?
Ovary, carcinoma	1	U-1	?
Sigmoid	1	E-1	0
Lung, primary	1	E-1	0
Kidney, primary	1	ID-1	1/2
Face, basal cell	1	D-1	0
Metastases from testis	1	IC-1	3/4
Sarcoma, thigh, muscle	1	U-1	?

A, marked effect but still under treatment.
B, marked effect, living more than one year. Tumors recurring, outlook questionable. The breast is again under treatment and responding. The patient with the cystadenoma refused further treatment.
C, marked effect; dead.
D, questionable slight effect.
E, little or no effect.
IB, incomplete; marked effect; living more than one year but prognosis poor; lost track of.
IC, incomplete; marked effect; dead.
ID, incomplete; some effect; dead.
IE, incomplete; little or no effect; dead.
U, incomplete; under treatment; too early for comment.

A serious question that has been under consideration from the first is the time interval that should be allowed to elapse between the injection of the lead and the irradiation. J. C. Mottram [3] has reported the most marked results with mouse tumors when the irradiation was given on the third and fourth days following the administration of lead. I have now adopted this as routine and the effect appears distinctly greater than when their radiation was postponed for from two to three weeks.

Two photographs are reproduced to illustrate what is meant by marked effect. The patient had been irradiated over a long period and regression could no longer be obtained. When the second picture was taken, she was at about the midperiod of treatment.

1520 Chapala

NOTE.—Since this paper was read, a patient who was receiving a tetra-ethyl lead compound developed a severe encephalopathy which lasted several days. As he had had only a small amount, much less than we expected would be necessary to produce such a reaction, I believe that tetra-ethyl lead compounds should not be used although this patient made a complete recovery.

[EDITORIAL NOTE.—This paper, together with that of Drs. Waters, Colston and Gay, which precedes it, and the papers of Drs. Soiland, Costolow and Meland, and Dr. Knox, to appear next week, constitutes a symposium on cancer. The discussion will follow the papers to be published in our next issue.]

3. Mottram, J. C.: Observations on the Combined Action of Colloidal Lead and Radiation on Tumors, Brit, M. J. 1: 132-133 (Jan. 28) 1928.

THE INTRADERMAL TREATMENT OF ARGYRIA*

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Since our [1] discovery that a photographic reducing fluid, injected into the skin, removes deposits of silver, an opportunity has been given to put the method to a practical test. The patient mentioned in our preliminary report has been under treatment for several months. In our experimental work a patch of argyria was produced by the injection of mild silver protein into the skin of the arm, and a single injection of the reducing fluid into this patch produced a small light spot very little if at all different in color from the normal skin. We realized that this was not as rigid a test of the power of the injection as would have been afforded by an old, more heavily infiltrated patch of argyria, but the hope was expressed that as old negatives reduce well with this fluid, old cases of argyria would also prove amenable. This hope has not been disappointed; but the reduction has been much less complete than in the experimental work. The first injection into the deep bluish gray skin produced a light brown, the shade of brown depending, apparently, on the depth of the injection and the readiness with which the lymphatics can carry off the fluid. On the eyelids, for instance, large bullae can readily be produced, but they subside slowly and result in comparatively slight change of color compared with that obtained from small amounts of fluid injected into the thick skin of the nose or chin.

In spite of the effort to place the injections as closely as possible, on subsidence of the slight inflammatory reaction resulting from the treatment a reticular marking of unremoved silver was seen between the points of injection, as shown in the accompanying illustration. Repetition of the treatment removed this. After several months of treatment, however, the face was still far from its original color, though much further

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1. Stillians, A. W., and Lawless, T. K.: An Intracutaneous Method of Treating Argyria: A Preliminary Report, Arch. Dermat. & Syph. 17: 153-155 (Feb.) 1928.

removed from the ghastly bluish gray of argyria. The lips, nose and chin have responded most rapidly, and although they have received comparatively few treatments they approach quite closely the normal color.

Our technic remains as at first, consisting of the injection through a platinum needle as superficially as possible of a mixture of 6 per cent sodium thiosulphate and 1 per cent potassium ferricyanide in distilled water. A 0.25 per cent solution of ferricyanide will do the work but it is somewhat less effective than the greater strength. Solutions of twice these strengths are made up and small quantities of these mixed in equal amounts as needed. The danger of decomposition of the mixture, mentioned in our preliminary report, is not great, for even 0.25 per cent ferricyanide shows no sign of decomposition within fifteen minutes after mixture with the thiosulphate in a test tube of 1.5 cm. in diameter.

The question of the possible danger from ferricyanide has been brought up as an objection to the treatment. Judging from our rabbit experiments, a person of 160 pounds (73 Kg.) should tolerate about 2 Gm. of the drug intravenously without symptoms. If given slowly the tolerance is greatly increased, for the drug

Argyria under treatment. The reticular marking was removed by repetition of the treatment.

is rapidly destroyed in the lungs. We have used 0.2 Gm. in 10 cc. of sterile distilled water, which gives an abundance for a two hour treatment period, during which more than 200 injections are frequently made. Much of the fluid is wasted, for the needle slips out of the skin, or there is backflow along the needle track or escape of the fluid through a hair follicle. The reducing fluid is probably a good antiseptic, for at no time during many thousand injections has there been the least sign of infection. It is also bland, for it has frequently spurted through a hair follicle into the eye of the operator without causing any irritation. In some parts of the skin considerable force is necessary for making the injection and the effort to hold the needle on the old style Luer syringe was very tiring to the fingers. The new syringe with a sleeve which locks the needle in place has been a great help.

The great difficulty with this method of treatment has been the need of anesthesia. The sting of the injection is considerable in any part of the skin, but about the eyelids and lips it is agonizing, lasting in diminishing intensity for an hour or more. Local anesthesia with procaine and epinephrine interferes with lymphatic drainage. Procaine alone may succeed. We have not tried it. A small dose of morphine and atropine has been sufficient to cut short the sting of injection and make the treatment endurable for a person of considerable stamina, such as our patient. We realize, however, that in some patients it would be objectionable.

In spite of our belief that intravenous injections of this reducing fluid would be useless because of oxidation in the lungs, we have tried it on a rabbit that had received, within three months, twelve intravenous injections of mild silver protein, ranging from 0.5 to 2 cc. of a 4 per cent solution. A piece was then cut out of the right kidney for a control. The rabbit was given eight intravenous injections of the reducing fluid, the dose ranging from 1 to 2.5 cc. The right kidney was then removed and compared macroscopically and microscopically with the piece previously removed. No appreciable decrease in the amount of silver was noted.

SUMMARY

The intradermal injection of a mixture of 1 per cent potassium ferricyanide with 6 per cent sodium thiosulphate removes a large part of the silver from the skin in old cases of argyria with deep pigmentation. The blue color disappears most easily. The same mixture injected intravenously seems to be without effect.

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HISTOLOGIC STUDY OF UTERINE SCARS AFTER CERVICAL CESAREAN SECTION *

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Much study has been devoted to the scars that follow classic cesarean sections, and of the numerous reports only nine concern themselves with intact scars. As far as we know, no one has reported a study of the scars that result from cervical cesarean sections. In a recent issue of the *Zeitschrift für Geburtshülfe und Gynäkologie* [1] is a histologic report of a uterus which had been subjected to two cervical cesarean sections and was removed at the end of the third pregnancy. We therefore present the results of our investigation.

At the Chicago Lying-In Hospital, 731 low, cervical cesarean sections (laparotrachelotomies) have been performed during the period from Feb. 5, 1915, to June 1, 1928. Of this number, ninety-three were repeated operations. Seventy-six patients had two, seven patients had three, and one patient had four operations. These repeated cesarean sections were performed from eleven months to seven and one-half years after the first operation. Two women in this series of ninety-three died (2.2 per cent). The total number of deaths in the entire series of 731 operations was nine, an incidence of 1.2 per cent.

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* From Northwestern University Medical School, the Chicago Lying-In Hospital, the Nelson Morris Institute for Medical Research, and the Snydacker Fund of the Michael Reese Hospital.

1. Ztschr. f. Geburtsh. u. Gynäk. 93: 453, 1928.

In thirty-seven instances at the time of the repeated cesarean section, a piece of tissue was removed from the site of the previous incision in the lower uterine segment. In sixteen instances the scar of the former incision was visible to the naked eye at the time of operation; hence removal of a piece of tissue was a simple procedure. In the remaining cases a scar was not visible but wide pieces were excised from the midline because all of the first incisions were longitudinal ones and were made in the midline. In addition to these thirty-seven pieces of tissue removed at the time of a repeated operation, a portion of the lower uterine segment was removed from six patients at the time of a first laparotrachelotomy for purposes of comparison.

The thirty-seven pieces of uterine wall, the description of which forms the basis of this paper, averaged about 5 cm. in length and 1 cm. in width. The thickness varied considerably and depended on the stage of pregnancy or labor at the time of removal. Most of the pieces of tissue were about 1 cm. thick, but a few were as thin as 5 mm. and others were as thick as 1.5 cm. Longitudinal and cross sections of each were taken and the tissues were fixed in 10 per cent solution of formaldehyde or in Zenker formaldehyde. The sections

Fig. 1.—Normal lower uterine segment; slightly reduced from a photomicrograph with a magnification of 60 diameters.

were stained by the Weigert-van Gieson method, which produces distinct contrasts between the red collagen, the yellow muscle, the black elastic tissue and the blue-black nuclei. In a few instances the Weigert modification (for elastic tissue) was omitted. Sections were also stained with hematoxylin and eosin; but, since we found the van Gieson method entirely adequate, we depended mostly on it for study.

The sections may arbitrarily be divided into four groups, as follows: (1) those which showed no scar tissue at all; (2) those which showed minor degrees of scarring; (3) those with undoubted scars in the old incision but in which the integrity of the uterine wall remained essentially unchanged, and (4) those in which the changes were striking and consisted of marked thinning of the uterine wall.

In examining the uterus for changes produced by the old incisions, we were especially interested in fibrosis, in narrowing of the wall, and in distortion of the tissues. As seen in the control cases, the normal uterus at the time the blocks of tissue were removed showed rather wide variations in thickness, apparently depending on the degree of advancement of labor. On an average, the wall measured 1 cm. as seen in the microscopic section, but it should be borne in mind that formaldehyde fixation and paraffin embedding produce shrinkage of the tissue to perhaps two thirds of the actual size. The muscle cells in the normal lower uterine segment (fig. 1) are hypertrophied and arranged in large bundles, separated by fairly thin strands of collagen, with very fine collagen fibrils surrounding the individual cells. Around the blood vessels, the fibrous tissue is more plentiful but its strictly perivascular character prevents its confusion with scar formation. In the parametrium there is usually a fairly distinct thin layer of fibrous tissue which probably blends with the subvesical fascia. Wherever collagen is present, one can usually find elastic tissue fibrils. In the normal uterus the latter are present mostly as very fine strands, but some coarser strands are also visible in the denser collagen. Except in the walls of blood vessels, the amount of elastica is very small as compared with that found in some of the scars. The endometrium varies considerably in thickness and usually shows a distinct decidual reaction; but where the epithelium tends to be of the endocervical type, with tall cells, large glands or even small nabothian cysts, the decidual reaction is either scanty or absent. In two of the control cases it was seen that the wall was composed almost entirely of fibrous tissue, and in both of these considerable edema had occurred, producing a separation of the collagenous strands. Since both of these blocks contained an endocervical type of epithelium, we consider the fibrous tissue in the wall as a normal constituent of this portion of the uterus rather than as representing a pathologic change. The edema and appearance of stretching of the tissues must have resulted from the tension exerted by pregnancy and labor on this part of the uterus, and this phenomenon will be mentioned later when we describe some of the scarred tissues in which a similar appearance was found.

GROUP 1

In all six instances in group 1 the indication for the first operation had been a contracted pelvis. Two of the patients had been in labor, one for nine hours and the other for thirty hours. In three instances the membranes were ruptured at the time of the operation, in one patient for twelve hours; in the other two the length of time was not stated. Two operations had been performed under direct infiltration anesthesia, procaine hydrochloride being used. In four cases continuous catgut had been used for closure of the wound, and in two instances interrupted catgut. Two patients had had mild fever, and in one of these the cause was a respiratory infection. In all the cases the wounds had healed by primary union.

The specimens in this group so closely resembled the normal uterus that they must be considered as examples of perfect healing. It is true that in two instances there were a few small localized areas of fibrosis, but these were not extensive enough to warrant attributing this change to faulty healing. The possibility that the exact site of the incision was not removed in these cases should not be overlooked, but we feel that this is improbable. The thirty-seven blocks of tissue were excised by five operators, all of whom had had considerable experience with the cervical operation and had successfully removed the remaining thirty-one blocks, all of which showed scarring in spite of the fact that only sixteen scars were visible to the naked eye. Furthermore, nearly all of the first operations in this series had been performed by these five operators. In two

of the six specimens in this group slight edema with separation of the muscle bundles had occurred, although the tissues were obviously taken from the upper portion of the lower uterine segment and were not fibrosed.

GROUP 2

There were five specimens in group 2. In four of the five patients from whom these specimens were obtained a contracted pelvis had been the indication for the first operation, and in the fifth case the operation had been done because of fibromyomas. Two of the patients had been in labor, and the bag of waters had been ruptured in three. One operation had been performed under local anesthesia, and in all the operations continuous catgut sutures had been used. None of the patients had had fever in spite of the fact that one had phlegmasia alba dolens. (We consider as "fever" every elevation of temperature to 100 or above, even if recorded but once, from the moment of delivery until the discharge of the patient from the hospital.) The wound had healed by primary union in all the cases. At the time of the repeated operation, the scar was visible in two instances.

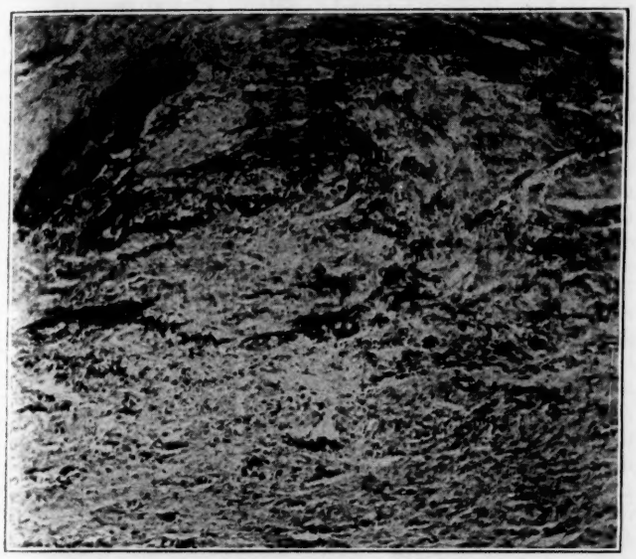

Fig. 2 (group 3).—Diffuse fibrosis with much elastic tissue; slightly reduced from a photomicrograph with a magnification of 60 diameters.

The five specimens in this group showed mild scarring of the uterus but not sufficient in our opinion to have interfered with the normal contractility and expansibility of the uterus. In three of these the change was represented by a moderate, diffuse increase in the fibrous tissue of the myometrium. This fibrosis not only involved the areas between large normal bundles of muscle but also extended into and partially replaced the muscle groups. The other two cases were placed in this group, not because of fibrosis but because of distinct localized puckering of the wall with resultant slight thinning of the myometrium. In these narrowed areas, only mild fibrosis had occurred, and we have interpreted them as indicating an almost perfect healing of the incision, in which the healing took place by growth of muscle rather than of fibrous tissue. In none of this group was any distinct edema present.

GROUP 3

In group 3 there were twenty-one specimens, which may be subdivided into two classes. The first contains fifteen and the second six blocks. The indications in the first subdivision had been contracted pelvis, ten; toxemia, two; heart disease, one; fractured pelvis, one, and bicornate uterus with transverse presentation, one. Nine patients had been in labor and the time varied from two to sixty-two hours. The membranes had been ruptured in one case. Ten operations had been performed under local anesthesia, and in all but one of the fifteen instances the wounds had been closed with continuous catgut sutures. In the exception, interrupted catgut had been used for closure. Twelve patients had had fever during the puerperium and the following complications had occurred: pyelitis, three; lochiometra, two; respiratory infection, two, and opening of skin incision, one. Two wounds had failed to heal by primary union. At the time of the repeated operation, a scar was visible in eight cases.

In the second subdivision of this group, three operations had been performed for contracted pelvis and two for toxemia. Three patients had been in labor twelve, fourteen and fifteen hours, respectively, and the membranes had been ruptured in one patient for sixteen hours. Two operations had been performed under local anesthesia and only one uterine wound had been closed with interrupted sutures. All the other wounds had been united with continuous catgut sutures. Two patients had had fever. One patient had had pyelitis and in one the bladder had been accidentally cut. The wound had healed by primary union in all of these patients. A scar was noted at the repeated operation in two cases.

We have placed in this group those specimens with more extensive scarring than that seen in group 2 and here also we do not believe that any possible malfunction of the uterus could have resulted because of these scars. These blocks are of two types—those without thinning of the wall but with marked diffuse fibrosis (figs. 2 and 3), and those with varying degrees of distinct constriction of the wall, with or without fibrosis (figs. 4 and 5). In most of the fifteen cases of the first type there was a considerable degree of fibrosis, extending in places entirely through the wall. Many of the scars were formed by dense masses of collagen, which had a tendency to be more copious on the parametrial side. From the center of these scars, in which no muscle or only small amounts of it remained, the

Fig. 3 (group 3).—Fine diffuse fibrosis; slightly reduced from a photomicrograph with a magnification of 50 diameters.

fibrous tissue extended radially, enveloping the small muscle bundles. In other areas, broad sheets of collagen had been deposited. The amount of elastic tissue was variable but seemed in general to vary directly with the amount and density of collagen, several of the scars containing quite heavy irregular bundles of elastica (fig. 2). Besides the diffuse, compact type of fibrosis, there were numerous, focal, patchy, fibrous areas. In only two of the fifteen cases was any distinct edema present, and these were uteri with densely fibrous walls

Fig. 4 (group 3).—The scar is one-third the thickness of the normal wall and consists essentially of fibrous tissue; × 9.

(fig. 6). The edema and tearing effect seemed especially marked in the fibrous tissue on the outskirts of the central mass of scarring, where strands of collagen extended into the normal myometrium. It is interesting to note that in one instance two foreign body giant cells were seen just outside the main area of fibrosis, and it is possible that these were remnants of an old reaction to the presence of catgut:

CASE 1.—In both longitudinal and cross sections there were a number of large areas of dense fibrosis with almost complete replacement of muscle by collagen and fairly heavy bundles of elastica. These patches of collagen were irregular in outline, and in most places dense and deeply stained. However, in some areas this fibrous tissue was pale-staining, loose and fibrillated. Through it ran an occasional isolated long muscle cell, suggesting that compact fibrous tissue bundles had been pulled apart from one another and from the few enclosed strands of muscle tissue. The densest portions of this diffuse scarring were found beneath the endometrium. In neither the longitudinal nor the cross sections was a distinct cicatrix apparent, although in one there was a gradual slight narrowing of the wall. For the most part the wall was composed of large bundles of hypertrophied muscle cells. The decidual reaction was exceptionally distinct. The fetal membranes were present. No cellular reaction was evident.

In the six other cases which form the second type in this group, distinct but moderate thinning of the uterine wall had occurred. In two instances the area of scarring measured only about half the thickness of the wall, in another three fifths, and in the remainder the cicatrization was less marked. With one exception these tissues had undergone extensive fibrosis, with deposit of heavy masses of collagen and elastic tissue, forming dense irregular scars involving the entire thickness of the wall and producing in the centers of the scars sharp puckering of the endometrium and parametrium. In the other case the narrowed portion of the wall was composed almost entirely of muscle, with an almost imperceptible increase of collagen, which was found in a narrow pathway extending between the two puckered surfaces. Another section from the same patient did contain a markedly fibrosed myometrium, but in this section no cicatrization had occurred. Two of the specimens were obtained from the endocervical region, as judged by the type of epithelium and absence of decidual reaction, and in only these two was distinct edema of the tissue apparent. One specimen in this group was obtained from a patient at the time of her fourth cervical cesarean section:

CASE 2.—One section obviously had been taken from the lower portion of the scar, since the epithelium of the endometrium was composed of low columnar and, in places, fairly tall columnar cells. One of the glands was dilated with mucus, forming a small nabothian cyst. Although the sections taken through the site of the old scar showed a marked increase of fibrous tissue, it was only in the lower section that distinct cicatrization of the wall had occurred, with reduction in the thickness of the wall to about three fifths of its normal size. Both endometrium and parametrium had been pulled into this densely scarred area, and the wall at this point was composed almost entirely of fibrous tissue containing a few isolated small bundles of muscle. The scarring was not limited to this zone, however, and throughout both sections heavy and fine deposits of collagen were seen through which ran variously sized muscle bundles. On the whole, the muscle tissue was markedly decreased in amount. The tissue was highly vascular, and although no hemorrhage had occurred, there were a number of areas in which the fibrous tissue strands were pale-staining, finely fibrillated and apparently edematous. It was in these areas, which were present in the center of the scar and especially at the periphery of the puckered area, that isolated muscle cells were seen coursing through this edematous collagen, producing a suggestion of disintegration of the tissues due to stretching. Sections from the upper portion of the scar contained a poorly formed decidua. No narrowing of the wall had

Fig. 5 (group 3).—Decidua drawn into fibrous scar; slightly reduced from a photomicrograph with a magnification of 60 diameters.

occurred, but, in the diffusely scattered masses of dense fibrous tissue, a number of areas of distortion and puckering of the wall were seen.

CASE 3.—From both the endometrial and the parametrial surfaces of one section, the uterine wall was drawn into a moderately distinct cicatrix which resulted in a reduction in the diameter of the wall to about half its normal size. This scar contained a fair amount of muscle tissue through which ran dense bands of compact collagen. These strands extended out into the thicker portion of the wall, tending to fade out away

from the puckered area. Interspersed in the scarred areas, especially in the denser portions, were moderately heavy bands and irregular collections of elastic tissue. No distinct edema was evident. The endometrium was thick and the decidual reaction distinct. In another section was some mild patchy fibrosis with one slight suggestion of cicatrization, but for the most part the tissue consisted of normal hypertrophied muscle cells.

GROUP 4

In group 4 were the worst scars. The first operation had been performed because of a contracted pelvis in

Fig. 6 (group 3).—Edema of fibrous tissue; × 100.

four cases, and for placenta praevia in the fifth case. Four patients had been in labor three, twelve, thirty-eight and forty-eight hours, respectively, and the membranes had been ruptured in one case for sixteen hours. Local anesthesia had been employed in two cases and continuous catgut had been used for the closure of all the uterine incisions. Four patients had had fever, one patient had had pyelitis, and one had had an infected wound. The scar was noted as being visible to the naked eye in three instances, but no mention was made of a scar in the other two records.

In this group of five cases, the thinning of the wall as a result of poor healing of the previous incisions was very marked. In all of them there were sharply localized areas where the wall was less than 1.2 mm. thick, which was on the average about one-tenth the thickness of the normal lower uterine segment. In one case it was only 0.3 mm. thick (fig. 7). The central portion of these scars was composed of mixtures of fibrous and muscle tissue, the former predominating in two cases, the latter in one. Two were obviously from the endocervical region. In all the specimens it was quite evident that the marked puckering was only one element in an extensive change in the myometrium, where a diffuse, irregular fibrosis tending to be confined to the region of the cicatrization had occurred (fig. 8). The collagen fibers extended out into bundles of muscle and not only divided the bundles into small groups but, in places, isolated individual cells, which stood out conspicuously against the red background. In this group, in which the injury to the uterine wall was most marked, the edema and stretching of the fibers was most striking. Two patients in this group had had two previous cesarean sections.

CASE 4.—One section contained a sharply cicatrized area of fibrosis where the uterine wall had been reduced to a thickness of 1.2 mm. and consisted of dense fibrous tissue in which were a few small bundles of muscle. As this thin scar was traced along, it suddenly spread out into the normally thick portion of the wall, measuring about 12 mm. Although the central portion of the scar was quite dense and compact, it could be seen to fan out into a very edematous pale-staining, loose, fibrous tissue in which numerous engorged vessels and lymphatics were evident. In this tissue isolated cells, as well as a few compact small groups of smooth muscle, were present, giving most of the tissue away from the central scarred area an appearance of having been pulled and partially torn. The edema extended into the endometrium, where a few scattered leukocytes had escaped from the vessels. The endometrium was of the endocervical type, with fairly tall epithelium and a poor decidual reaction. In the other sections, dense scars and cicatrization were present, along with marked edema of the tissues. The reaction was obviously an extensive one, so that very little muscle tissue remained in the uterine wall.

CASE 5.—In the cross section (fig. 7) there was an area of striking reduction in the thickness of the wall of the uterus, so that for a distance of about 2 mm. the myometrium varied from 0.3 to 0.6 mm. The tissue in this zone was composed of compact, compressed, interlacing bundles of collagen and muscle, with the latter preponderating. Into this scar the endometrium and parametrium were sharply drawn. From this area the myometrium suddenly fanned out on both sides into the more nearly normal wall, which measured about 6 mm. in thickness. From the scarred area into the thick portion of the wall there radiated long strands of collagen. In a few areas fairly dense masses of collagen had been deposited. A longitudinal section from the same patient revealed some cicatrization and thinning of the wall, with sharp puckering of the tissues from the endometrial surface. The myometrium was diffusely fibrosed and the muscle tissue that remained was cut into small and irregular bundles of cells. In this section there was some localized edema of the collagen where the fibrosis was most marked.

COMMENT AND SUMMARY

In our series of thirty-seven cases, pieces of tissue were removed at the time of a repeated cervical cesarean section from the site of the previous incision. There were five scars (13.5 per cent) which were so thin that from an anatomic point of view it would seem almost certain that the uteri containing them could not stand

Fig. 7 (group 4).—Worst scar in the entire series; in this scar, muscle fibers predominate; × 10.

a test of labor. Actually, however, two of the five patients had been in labor before the repeated operation was performed.

From these few cases, no genuine deductions can be drawn. However, in the entire world literature there are only twelve authentic cases of rupture of the uterus after cervical cesarean section in cases in which the incision had been limited to the lower uterine segment. There have been a few more ruptures of the uterus

after cervical cesarean sections, but these ruptures occurred either in the fundus or in the fundal part of an incision which began in the lower uterine segment. All of the ruptures occurred in patients who had been in labor a long time and no uterus ruptured during pregnancy. As far as we know, not a single patient on whom we performed a cesarean section (731 operations) had had a rupture of the uterus in a subsequent pregnancy or labor. We have seen at least twelve vaginal deliveries after the cervical cesarean sections. One of our patients had two vaginal deliveries after one cesarean section and another patient had two deliveries from below after two cervical cesarean sections. Other writers have reported far greater numbers of deliveries per vias naturales following cervical cesarean sections. For example, Huber [2] reported twenty-eight vaginal deliveries in a series of fifty-one cervical operations of the type we performed (54.9 per cent).

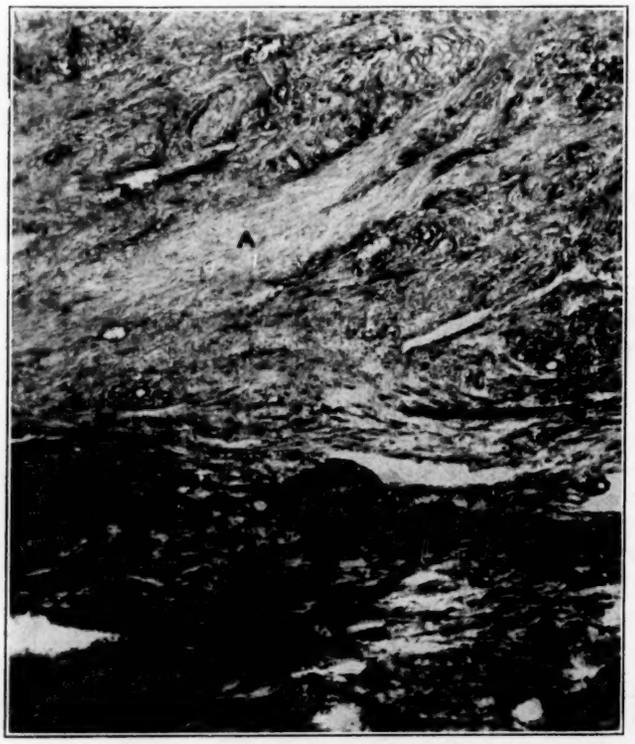

Fig. 8 (group 4).—A relatively strong portion of the scar in which there is extensive fibrosis; a long strand of muscle tissue is visible at *A*; × 60.

Since the proportion of the bad scars in our patients is probably not much greater, if any, than that generally obtained, it would seem to follow in view of the very few ruptures reported after cervical operations, that an anatomically weak scar does not necessarily presuppose inability to withstand the distention caused by pregnancy or the strain of labor.

Contrasted with the group of five scars which were anatomically very poor were six (16.2 per cent) pieces of tissue in which no scar tissue at all could be found. These almost certainly represent perfect anatomic healing because the blocks were removed by experienced operators who knew where to find scar tissue if any was present. Between the group showing perfect healing and that showing very poor scars were twenty-six pieces of tissue (70.3 per cent) which showed evidence of scarring, which was not, however, sufficient to imply even the likelihood of failure to withstand the test of labor.

It is hazardous to draw conclusions from our small series of cases. It may be seen, however, from the accompanying table that the worse the scars were the greater were the number of patients in labor at the time of the first operation. There seems to be no relationship between rupture of the membranes and wound healing.

It is generally believed that wounds heal best when interrupted sutures are used. In our series only four wounds were closed entirely with interrupted sutures. Two of these incisions failed to show any scarring at all, while the other two contained a good deal of scar tissue but were anatomically strong (group 3). In these four cases no bad scars resulted and, although the number is small, we feel that closure with interrupted sutures will yield better scars than closure with continuous sutures.

One third of the patients in group 1 had fever post partum; two thirds of those in group 3, and four fifths of those in group 4. However, the presence of fever does not imply poor healing nor does absence of fever mean perfect union. Infection of the abdominal incision occurred only in groups 3 and 4, and complications in the puerperium occurred most frequently in group 3.

Information Concerning First Cesarean Section

	Group 1 Perfect		Group 2 Good		Group 3 Fair		Group 4 Poor	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Number of scars	6	16.2	5	13.5	21	57	5	13.5
In labor	2	33.3	2	40.0	12	57.1	4	80.0
Membranes ruptured	3	50.0	3	60.0	2	9.5	1	20.0
Interrupted sutures	2	33.3	0	0.0	2	9.5	0	0.0
Scar visible at operation	0	0.0	2	40.0	10	47.6	3	60.0
Fever	2	33.3	0	0.0	14	66.7	4	80.0
Infected abdominal incision	0	0.0	0	0.0	2	9.5	1	20.0
Complications	1	16.7	1	20.0	9	42.9	1	20.0

The edema and appearance of stretching of the tissues that was found in a large number of the specimens at first suggested an early tearing of the uterine wall. This seemed to be more marked in the densely fibrous scars but was present in normal uteri as well, so that we do not feel justified in attributing this appearance to any malfunction of the uterus. We believe that this change is due to varying degrees of tension exerted on the lower uterine segment before and during labor, because it was found late in pregnancy as well as during labor.

185 North Wabash Avenue.

2. Huber, H.: Schweiz. med. Wchnschr. 54: 963 (Oct. 23) 1924.

Country Doctors.—These country doctors are men whose rugged bodies and brusque manners conceal hearts of the most tender humanity and the deepest understanding. Their hours are not spent in stuffy palaces which are crowded with the softest comfort of ease but are eaten up by long, hard drives over wind-swept, snow-obliterated, rain-sodden roads on errands of mercy, often when they know that the recipient of their ministrations has not a cent with which to reward them. Instead of softly lighted rooms and the tinkly laughter of exquisitely gowned women as an accompaniment to evenings of bridge or the theater, they spend a howling night at the bedside of some vociferous country lass who is presenting her temporarily repentant spouse with the first fruits of matrimony. Or by the pallet of some flushed, dry-eyed tot who battles the scourge of illness in an ill ventilated farmhouse, while the anxious parents place a trust in this rustic healer that is next only to their God. —Breuer, R. G.: A Premature Pronouncement of Dissolution, *J. Kansas M. Soc.*, December, 1928.

IMPROVED TECHNIC OF THE TWO FLAP LOW INCISION CESAREAN SECTION *

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About ten years ago I [1] described a modification of the Krönig cesarean section. The procedure was called the two flap low incision cesarean section to distinguish it from the original one flap operation. Following this publication McGlynn,[2] Hirst,[3] De Lee,[4] Phaneuf,[5] Bailey [6] and others have referred to a similar technic in their writings in favor of the low procedure.

The advantages of the low cesarean section over the classic operation have been repeatedly emphasized in the literature of the past fifteen years. Most of the reports have been made by men who favored the operation and for this reason some readers no doubt have regarded their work as that of enthusiasts. One of the best arguments for the low section is a recent report of a cesarean section survey made by the Brooklyn Gynecological Society.[7] This survey was conducted by a special committee, no member of which was partial to the low operation. The records of 1,202 operations performed in thirty-four Brooklyn hospitals were subjected to an impartial analysis; 1,015 classic operations were done with sixty deaths, a mortality of 5.9 per cent. During the same period 187 low sections were performed with a mortality of 4.2 per cent. Not only do these figures favor the latter technic, but further investigation of the conditions present at the time of operation shows that the classic procedure was chosen more frequently when the essentials for an elective operation were present, while the low technic was followed when the operators thought that the classic operation was contraindicated. In other words, many surgeons selected their cases and placed the greater burden on the low operation, as is shown by the fact that 53 per cent of the classic cesarean sections were done on women who were not yet in labor or who had been in labor less than six hours, while 66 per cent of the low sections were done after more than six hours of labor.

Three hundred and ninety women who had not been in labor and were not examined vaginally were operated on by the classic technic and thirteen died, a mortality of 3 per cent. Fifty-eight low operations were done under similar circumstances without a death.

When the operation was done more than six hours after the onset of labor the mortality was 12.3 per cent for the classic cesarean sections and only 5.6 per cent for the low operation. A detailed analysis of the results in the patients operated on after more than six hours of labor is shown in the accompanying table, which is copied from the report already referred to.

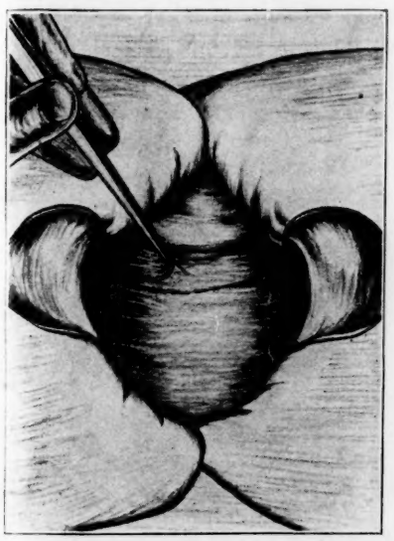

Fig. 1.—Peritoneum picked up about 2 cm. above upper margin of bladder. Dotted line on uterus corresponds to region of firmly adherent peritoneum.

Fig. 2.—Peritoneum has been cut transversely for 7 cm. Cut edge on left is elevated and scissors have dissected the peritoneum and bladder free from the uterus on this side.

Fig. 3.—Finger in free space completes the dissection on left of midline. The same procedure is repeated on the right side. The midline is more adherent and therefore is avoided at this time.

Cesarean Sections After Six Hours of Labor in Thirty-Four Brooklyn Hospitals

Hours in Labor	Classic Operation				Low Operation			
	No Vaginal Examinations		Vaginal Examinations		No Vaginal Examinations		Vaginal Examinations	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
6-12	89	5	48	4	13	0	7	0
12-18	50	2	29	4	11	0	3	0
18-24	50	2	45	5	11	0	11	0
24-30	34	2	11	0	4	0	6	2
30-36	18	1	20	2	7	0	6	1
36-42	8	0	6	1	2	0	4	1
42-48	14	1	13	0	8	0	8	1
Over 2 days	10	3	27	11	10	1	12	1
Total cases	472 with 43 deaths; 12.3%				123 with 7 deaths; 5.6%			

* From the Department of Gynecology and Obstetrics of the Long Island College Hospital.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 13, 1928.

1. Beck, A. C.: Am. J. Obst. & Gynec. **79**: 197 (Feb.) 1919. At the time of this publication the author had not found any references to the two flap operation in the literature. He has since read a perfect description of the same technic published in 1911 by Opitz in the Zentralblatt für Gynäkologie.
2. McGlynn, J. A.: Am. J. Obst. & Gynec. **1**: 45 (Oct.) 1920.
3. Hirst, J. C., and Van Dolsen, W. W.: Cesarean Section, J. A. M. A. **79**: 2047 (Dec. 16) 1922; The Place of the Low Cervical Cesarean Section, ibid. **82**: 103 (Jan. 12) 1924.
4. De Lee, J. B., and Cornell, E. L.: Low Cervical Cesarean Section (Laparotrachelotomy), J. A. M. A. **79**: 109 (July 8) 1922. De Lee, J. B.: Low or Cervical Cesarean Section (Laparotrachelotomy), ibid. **84**: 791 (March 14) 1925.
5. Phaneuf, L. E.: Surg. Gynec. Obst. **37**: 765 (Dec.) 1923.
6. Bailey, Harold: Am. J. Obst. & Gynec. **12**: 550 (Oct.) 1926.
7. Gordon, C. A.: Am. J. Obst. & Gynec. **16**: 307 (Sept.) 1928.

In this paper a detailed description of each step in the procedure will be given and a further modification will be shown.

ABDOMINAL INCISION

The abdomen is opened by a low transverse or midline incision below the umbilicus. Retraction of the wound edges reveals the lower segment of the uterus with the bladder and its peritoneal reflection.

Preparation of Lower Flap.—The peritoneum is picked up about 2 cm. above the upper margin of the bladder (fig. 1). Here the attachment is very slight and it can be easily separated from the underlying tissue. One must be careful to elevate only peritoneum as otherwise he may miss the desired plane of cleavage and make the dissection a bloody and traumatic procedure. Likewise the preparation of the lower flap should always begin below the transverse line of firmer peritoneal attachment. This line of attachment is quite evident if one looks for it, as is indicated by the dotted line in figure 1.

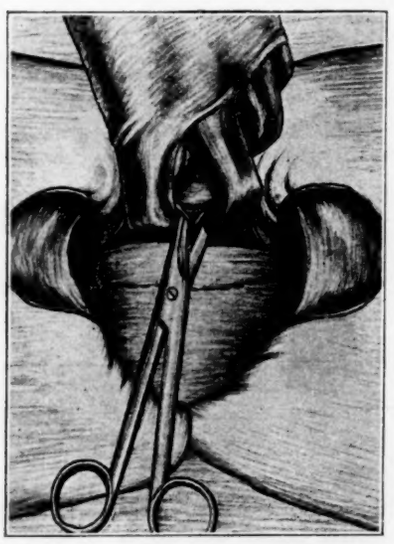

Fig. 4.—Fingers in free spaces retract bladder and expose adherent tissue in midline which is to be cut by the scissors. The points of the scissors are directed toward the uterine wall rather than toward the bladder.

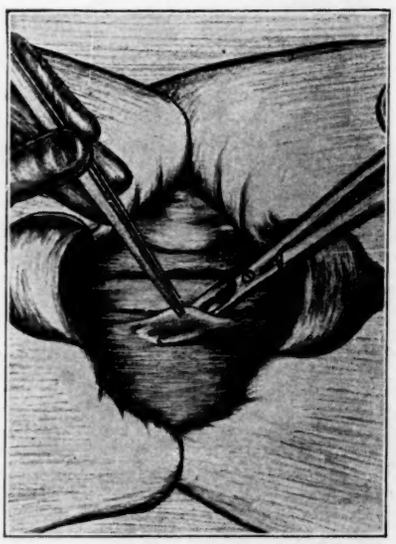

Fig. 5.—Peritoneum 3 cm. above transverse incision is again cut transversely for 5 cm. Upper flap prepared by blunt dissection with scissors. If the patient has had several hours of labor, this flap will be entirely below the zone of firmly attached peritoneum.

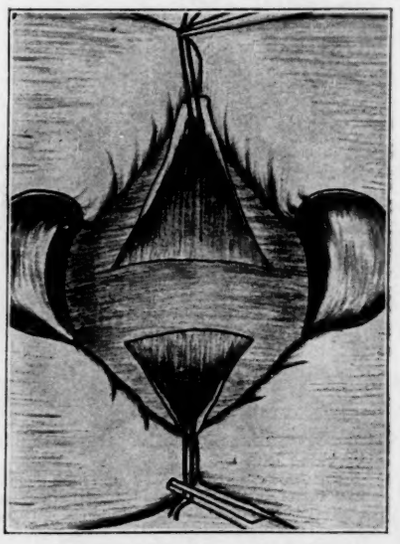

Fig. 6.—Prophylactic traction sutures introduced at apexes of denuded areas. Broad bridge of undisturbed peritoneum forms the base of each denuded triangle.

The elevated peritoneum is nicked and a transverse incision about 7 cm. long is made (fig. 2). This incision should not be made by a knife, as one may cut too deeply and miss the proper cleavage zone. The lower margin of the peritoneal incision is now elevated on the left side of the midline and the closed Mayo scissors are passed downward between the bladder and uterus. The scissors are then opened and while they are still spread apart are withdrawn (fig. 2). Into the space thus dissected the finger is introduced to complete the freeing of the peritoneum and bladder on the left side (fig. 3).

The peritoneum on the right of the midline is elevated, and a similar blunt dissection frees this side of the lower flap.

So far the midline has been avoided and a line of attachment remains in this region. Two fingers of the left hand are passed into the dissected areas on each side of this midline attachment (fig. 4). The bladder is gently pulled away from the uterus and the well exposed line of adhesion is cut. The lower flap is now freed from the uterus for about 6 cm. below the original transverse incision. If the dissection is properly done there should not be any hemorrhage and the uterine surface should be very little traumatized.

Preparation of Upper Flap.—About 3 cm. above the transverse peritoneal incision the peritoneum is again picked up, nicked and cut transversely for about 5 cm. On each side of the midline the closed scissors are passed upward beneath the peritoneum and opened while in place. Thus by blunt dissection the upper flap is freed to the extent of about 4 cm. The dissection in this region is more difficult, as the areas of adhesion are found on the sides as well as in the midline. The peritoneum should be freed as much as possible by blunt dissection with the scissors. However, it will be necessary to cut adhesions in several places. With care this flap can be prepared by an almost bloodless dissection (fig. 5).

Traction sutures are now introduced at the apex of each denuded area as shown in figure 6, which also gives a clear idea of the band of undisturbed peritoneum between the tissues from which the peritoneum has been freed.

If the operation is done several hours after the onset of labor, both flaps will be below the dotted line which represents the zone of greater peritoneal attachment. When it is done early in or before labor, the upper flap frequently will be above this area.

INCISION IN UTERINE WALL

After the peritoneal cavity has been walled off, a Deaver retractor is placed between the lower flap and the uterus. This instrument not only retracts the bladder but serves as a guide for the vertical incision, should the field become obscured by blood and amniotic fluid. It therefore should be kept constantly in place until the incision is finished. After a stab wound has been made in the region shown in figure 7, the lower two thirds of the incision is completed by cutting with a pair of straight scissors. If the flow of blood and amniotic fluid obscures the field of operation, the operator need have no hesitancy in deliberately continuing the incision as the bladder is held out of the way

by the Deaver retractor. The scissors are then turned upward and the upper third of the incision is made.

DELIVERY OF THE CHILD

The left hand is introduced into the uterine cavity below the presenting part to favor the delivery of the head through the wound while the assistant makes pressure on the fundus (fig. 8). Forceps seldom are required. If a hand or arm comes out before the head is delivered, it should be replaced within the uterine cavity. Podalic version may be done but is seldom necessary if the technic described is followed. Solution of pituitary should not be given until the child is out.

DELIVERY OF THE PLACENTA AND CLOSURE OF UTERINE WOUND

Unless the placental site has been cut by the uterine incision and the hemorrhage is profuse, the placenta should not be disturbed until after the deep sutures are introduced. Traction on the two sutures that were introduced before the uterus was incised brings the uterine wound into view and plugs the abdominal wound with the uterus so that the intestine is kept out of sight. Deep interrupted sutures are placed at intervals of about 1.5 cm. These pass through the muscle wall down to but not through the endometrium (fig. 9). These sutures are not tied at present but are clamped near their ends (fig. 10). After the introduction of the deep sutures, the wound is again separated (fig. 11) and the whole hand is passed into the uterus between two of these sutures. The placenta is then removed manually. Usually the placenta is almost separated and the placental site does not bleed as profusely as it does when the placenta is removed immediately after the delivery of the child. Traction on the clamps that

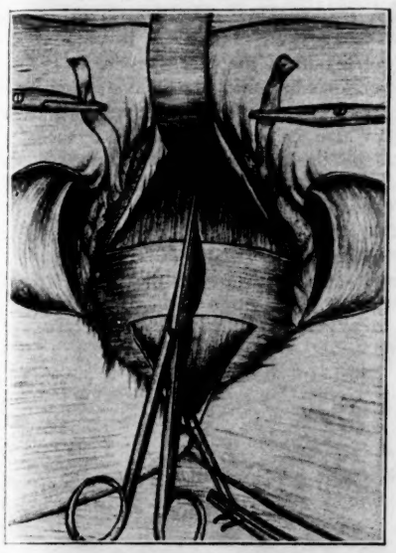

Fig. 7.—Abdominal cavity protected; bladder retracted by Deaver retractor; uterus being incised vertically by scissors.

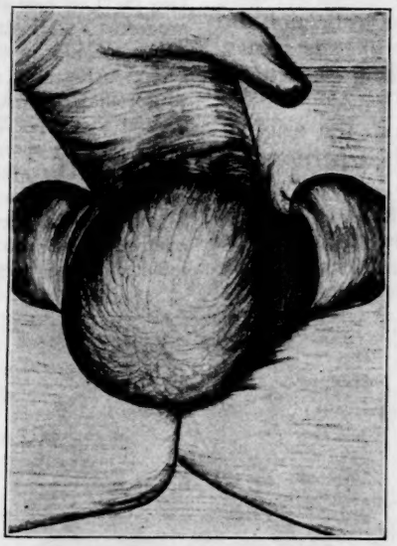

Fig. 8.—Delivery of the head through uterine and abdominal incisions.

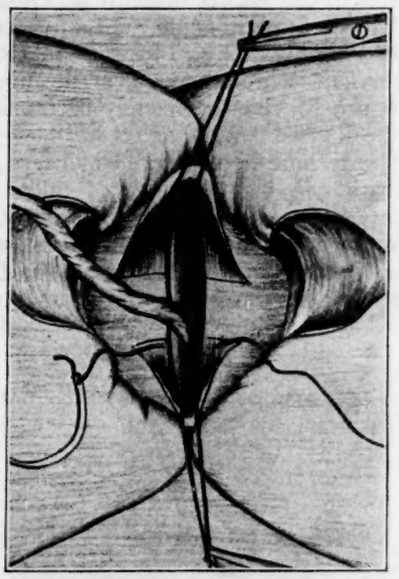

Fig. 9.—Traction sutures pull uterine wound into abdominal incision; placenta left in situ; interrupted suture introduced through uterine wall down to endometrium.

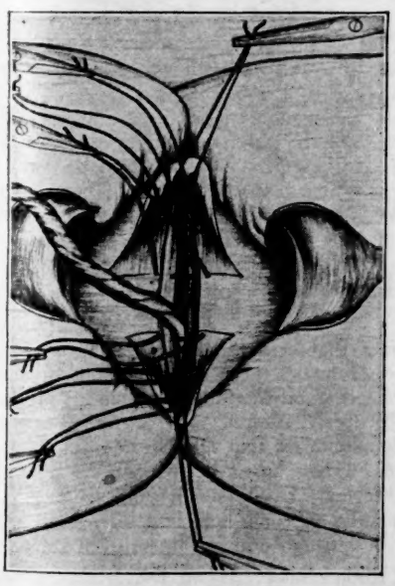

Fig. 10.—All deep sutures introduced and clamped at their ends; placenta still undisturbed.

Fig. 11.—Uterine wound again separated between two of the interrupted sutures. Whole hand is then introduced for manual removal of placenta.

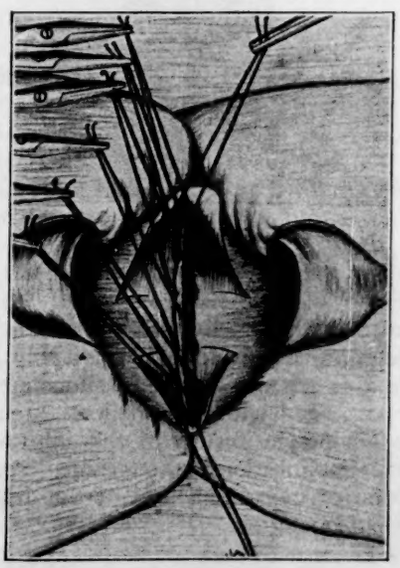

Fig. 12.—Traction on clamps closes uterine wound and lessens hemorrhage from placental site.

hold the interrupted sutures closes the uterine wound immediately and thus diminishes the third stage hemorrhage (fig. 12). A second series of interrupted sutures completes the closure of the uterine incision. These are placed midway between the deep ones and pass through only about half the thickness of the uterine wall (fig. 13).

SUTURE OF FLAPS

The upper flap is brought down over the bridge of undisturbed peritoneum and anchored by two interrupted sutures (fig. 14). The bladder reflection or lower flap is brought up over the upper one, as shown in figure 15, thus completely peritonealizing the wound in the uterus.

The technic here described differs from the original operation in that a bridge of undisturbed peritoneum is left between the flaps. Formerly it was necessary to make a much longer transverse incision in the peritoneal reflection and to dissect the bases of the flaps laterally almost to the round ligaments in order that the head might be delivered without injury to the peritoneum. This modification not only leaves a considerable area of undisturbed peritoneum but accomplishes the same end with a much less extensive dissection of the flaps. The results of this improvement, therefore, are a simplification in the technic, less trauma, and elimination of more than half of the dead space left after the old operation.

20 Livingston Street.

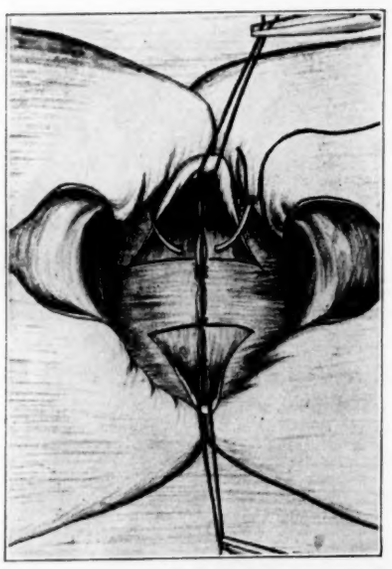

Fig. 13.—Second series of interrupted sutures placed midway between deep ones. These pass through about half the thickness of the uterine wall.

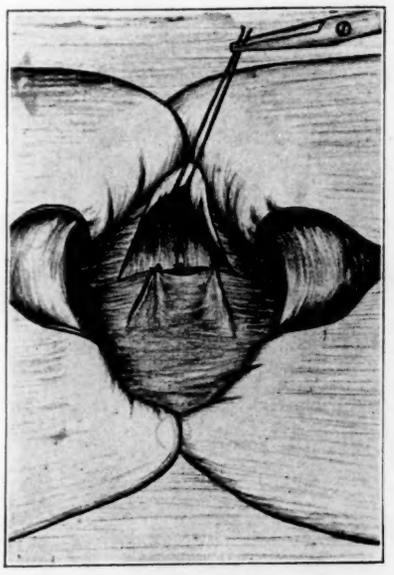

Fig. 14.—Upper flap pulled down over bridge of undisturbed peritoneum and anchored by two interrupted sutures.

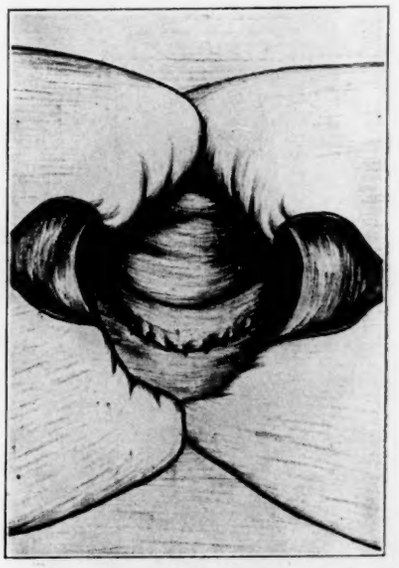

Fig. 15.—Lower flap brought up over upper one and sutured, thus completely sealing incision in uterus. In a short time the uterine wound will be extraperitoneal.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. GREENHILL AND BLOOM AND DR. BECK

DR. JOHN O. POLAK, Brooklyn: The first point that I wish to make is that the general mortality from cesarean section throughout this country is very much higher than is generally supposed. We are not all so adept as the surgeons at the Chicago Lying-In Hospital, where 735 operations were done with only nine deaths. The statistics that Dr. Beck gave us were based on operations done in thirty-four hospitals by approximately 200 different operators, and from these we may get some idea of the results of cesarean section among the surgeons of this country. These results are in line with a statistical study which I made several years ago of 2,200 operations done by the best operators in which there was a mortality of 3 per cent in clean cases, 6 per cent in patients that had been in labor, and 14 per cent in those in whom the membranes had ruptured. The next important point is that the time element in doing a cesarean section is not as important as is generally supposed. If the section is done under local anesthesia and gas, it can be done with detail and time can be taken. The advantage of the operation that Dr. Beck has demonstrated is this: Surgeons who are doing section are all convinced that the low operation is the operation of choice for the woman who has been in labor. Dr. De Lee has shown that the low operation is the elective procedure. Dr. Beck's suggestion is that by leaving an area of peritoneum, in the retraction of the uterus, there is not such an extensive area to peritonealize and one is consequently not so apt in making the incision through the uterine wall to tear beyond the upper flap, which is very important for those who are doing this operation for the first time. I am impressed with what Drs. Greenhill and Bloom have shown, because it brings out again what has been taught for a long time; i. e., that because of the fact that the uterus is a contractile organ, it contracts and retracts, and furthermore there is a potential infectivity from its inner surface after the first few days, and also because of the fact that cesarean section is done almost invariably after a test of labor, there are infections of scars. The solidity of a scar depends on whether the wound is properly made; whether it is properly sutured; the degree of trauma, and asepsis. It is a delight to me that Dr. De Lee has accepted the interrupted suture. I have used it ever since I first did cesarean sections. Everybody has tossed it aside, so that it is worth traveling 1,500 miles to come here and learn that better results are being had in Chicago with an interrupted suture.

DR. E. B. PIPER, Philadelphia: When Dr. Beck presented his results in Philadelphia, I promised him that I would do three sections. I did one. There was so much hemorrhage I did not want to perform the operation again. The reason for that was, probably, that I did not carry out the technic correctly. I never was very fond of the original two-flap operation. I do not believe in making a low section or a high section. I believe a section should be done with the incision low down, and just a little above the one employed by Dr. Beck. However, I am probably going to be a convert to the low cesarean section. If one goes into a clinic like Dr. Polak's in Brooklyn or the Lying-In Hospital in Chicago, or some of the hospitals in Philadelphia in which the personnel is trained, the statistics will be much better than they are in other hospitals. What sort of result does Dr. Beck get in the second and third operation? How can he do that operation as easily as he would the old-

fashioned longitudinal incision? I was very much impressed by Drs. Greenhill and Bloom's paper, and I should like to be able to get statistics like those in cesarean section if I did them all myself. I should like to ask them one question: How often are the temperatures taken?

DR. JOSEPH B. DE LEE, Chicago: I agree with Dr. Polak about the high mortality rates in various parts of the country from the old classic cesarean section, and I think that if he were to get them from all over the United States they would be still larger than those he quoted. Three per cent mortality in clean cases in the old classic cesarean is very low, and a great many surgeons would consider it creditable. I believe that it is still higher. Patients that have been in labor for a long time show sometimes 10 and 15 per cent mortality in groups of 100 or 120. The new operation is a little more difficult than the old one. Occasionally, complications will occur in the low operation that will test the skill of many operators, but these are rare, and if the surgeon will wait until the woman has been in labor a reasonable length of time, at which time it is also safe to do the low cesarean, these complications will never arise. Regarding Dr. Beck's operation, it adds a little more technic and possibly for the first time may be a little more difficult. The only reason that I might object to it, however, is that in the second and the third operations, the peritoneum would be pretty well used up, that having been my experience with the low operation, performed as it used to be with the two-flap method. I have given up the two-flap method in the low cesarean section in all cases except those in which I suspect that the woman is infected or is likely to develop fever. In such cases, I am glad of the double protection that two layers of peritoneum give. In all clean cases I simply return the peritoneum to its original site because in the next operation I want to have as much of this membrane as possible. I was very much pleased with the result of Drs. Greenhill and Bloom's studies of the scars that were exsected at the time of second low cervical cesarean operations. While some of the pictures show a great deal of scarring, that does not mean that those tissues would have given way during labor. In fact, in some of the cases that I have seen at the second operation in which tissue was not removed, the tissues were very thin and yet withstood labor. That is also true to an extent of the old classic cesarean section. I have had women who were delivered for the second time after a classic cesarean operation who have shown scars that were just as thin as these, but nevertheless they withstood the powerful action of the uterus even though they were placed in the fundus. The suturing of the wound, however, is most important, involving as it does accurate coaptation, absence of strangulation of the tissue by continuous suture, the preservation of asepsis, and deliberation in technic without wounding the tissues. Operation done under local anesthesia obviates the necessity of haste and puts to shame those who proudly boast that they have done a cesarean section in six, or ten or twelve or eighteen minutes.

DR. ALFRED C. BECK, Brooklyn: First, I will answer Dr. Piper's question. My experience concerning reoperation with this new modification is nil because I have been using this particular technic for only one year. In the old two-flap operation, however, my results were not as Dr. De Lee described them. I am able to dissect the flaps rather easily. Dr. De Lee stated that possibly this new technic might be a trifle more difficult. It seems more difficult from the illustrations, but as a matter of actual fact it greatly simplifies the old operation. I do not think that the question of using up the peritoneum enters into the proposition at all. I believe that if some of the patients die when the Krönig operation is done and there is another step that may save these patients, and that step is not a difficult one, it should be used. Whenever the patient's condition is such that we can use this procedure, we do so in preference to either the classic or the Krönig technic.

DR. J. P. GREENHILL, Chicago: In regard, first, to Dr. Piper's question, the temperature of every patient in the hospital is taken every four hours unless for special reasons it is taken more often. With reference to Dr. Polak's remarks about infection, I should like to say that in only two of our specimens did we find evidence of round cell infiltration and in neither one could we demonstrate bacteria. It may be that in both cases there was some chemical cause for the round cell infiltration. Neither of the patients from whom the blocks were obtained had been in labor at the time the scar tissue was removed. Dr. Beck's contribution, of course, is a new one. In one of his illustrations he demonstrated elevation of the peritoneum with scissors. As Dr. De Lee mentioned, we do practically all of our cesarean sections under local anesthesia, using procaine hydrochloride. We infiltrate under the bladder peritoneum. Of course, the peritoneum rises when the procaine is injected, so there is no difficulty in getting an easy separation of the peritoneum as far out as it is wanted. It struck me from the illustrations that Dr. Beck makes the incision much higher than we do. In most of our cases we perform a true cervical cesarean section; that is, the incision is limited entirely to the lower uterine segment. We often go to within a centimeter of the external os. Some of our specimens were removed so near the external os that they failed to show a decidual reaction. The incision is limited to the area of the lower uterine segment, which is below the line of firm attachment of the peritoneum to the uterus. It seemed to me that Dr. Beck's illustrations indicate that the incision he makes begins in an area that is part of the body of the uterus and not the lower uterine segment, for he begins the incision above the line of firm attachment of the peritoneum. The incision most likely does not extend down as low as the one we make. I might also add that one of the scars in our patients was taken at the time of the third cervical cesarean and another at the time of the fourth cervical cesarean section, and these scars were placed in our third group and not in our fourth one.

AN ANALYSIS OF THE 1927 EPIDEMIC OF INFANTILE PARALYSIS IN MASSACHUSETTS *

ARTHUR T. LEGG, M.D.
BOSTON

During 1927 Massachusetts was visited by an epidemic of infantile paralysis next in severity to that of 1916; 1,189 cases were reported. The Harvard Infantile Paralysis Clinic at the Children's Hospital is treating more than half this number, or 636, and I shall analyze these cases, not only to record the different phases of the attack but to have an early record in order that we may follow the cases for further study of their progress.

Owing to the interest and cooperation of the physicians in the different towns and cities, we have been able to make the initial examination of patients in this epidemic much earlier than in previous years. The average interval between the onset of disease and the first examination in this study has been six weeks. However, in spite of the fact that these examinations took place on an average of only six weeks after the onset of the disease, it must be borne in mind that undoubtedly some spontaneous recovery had already taken place.

GEOGRAPHIC AND SEASONAL DISTRIBUTION OF THE DISEASE

The eastern part of the state was by far the most affected, Boston reporting 277 cases, and Haverhill 111 cases. The occurrence rate of Boston was 0.35 per thousand, and of Haverhill, 2 per thousand. However, Ipswich, a small town 13 miles east of Haverhill, reported twenty-six cases with an occurrence rate of 4 per thousand. This is the largest occurrence rate I have ever seen reported.

* Read before the Section on Orthopedic Surgery at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 14, 1928.

As in former epidemics, the greatest number of cases occurred in the early fall, with 373 cases in September and 376 in October. The epidemic years in Massachusetts have shown a beginning rise in the number of cases during the latter part of July or early August, with a rapid rise to September and October, followed by a decided drop in November.

FATALITY RATE

The death rate in the 1927 epidemic was 14.2 per cent. This, of course, varies with different epidemics. In 1916 and 1920 the death rates were 23.5 and 20.7 per cent, respectively.

AGE, SEX AND FAMILIAL INCIDENCE

The average age of patients in this series was 5.4 years, while the average age of those reported throughout the state was 7. The males predominated in all years, except at 4 and 5, when the females predominated, and at 10, when they were equal.

Instances of more than one case in the same family occurred thirty-two times in 755 families, or 4.2 per cent. One family in Haverhill had four children affected, in two of whom the disease proved fatal.

SENSITIVENESS

Sensitiveness was present at the initial examination in 68.7 per cent of the cases. Since, however, these examinations were made on an average of six weeks after the onset of the disease, there were undoubtedly many cases in which sensitiveness had disappeared before examination, and I believe that it is probably present in from 75 to 80 per cent of all cases. It is interesting to note that sensitiveness was about three times more frequent in the legs than in the arms. The average duration of sensitiveness was 6.4 weeks after the first examination, which, of course, means about twelve weeks after the onset.

INVOLVEMENT

The distribution and severity of involvement vary more or less with the different epidemics; but some general facts seem to be constant. In the compilation of these data, 436 cases have been studied.

In the 1927 cases the abdominal muscles showed 83 per cent involvement, which was considerably greater than that of any other part of the body. This is true, also, for the years between 1916 and 1924. The average abdominal involvement of the years between 1916 and 1924, however, was a little less than 70 per cent. There was a much greater involvement of the neck and back muscles in 1927 than in the years between 1916 and 1924.

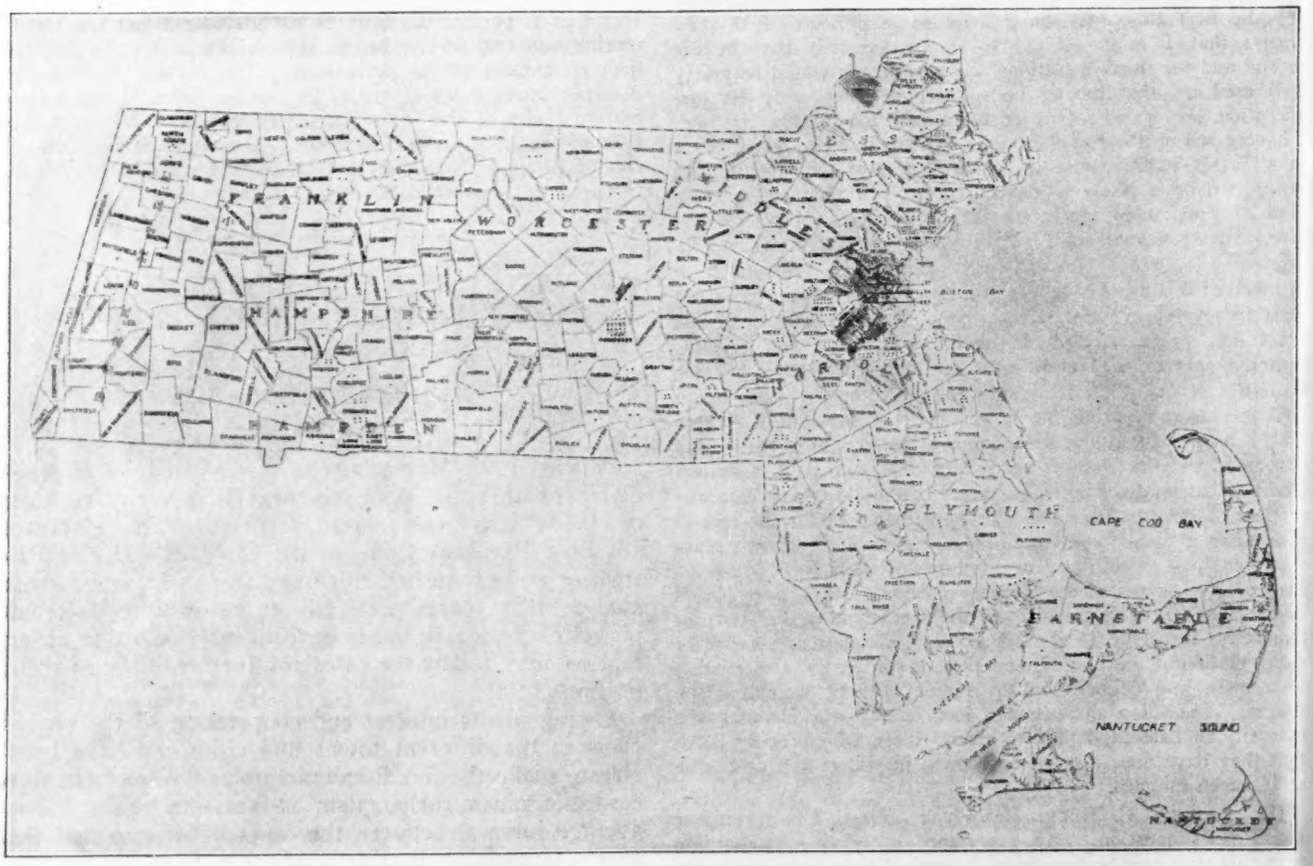

Fig. 1.—Geographic distribution of 1927 epidemic of infantile paralysis in Massachusetts; total number, 1,189.

In all the epidemics that I have studied, the legs always show a much greater amount of involvement than the arms, with practically no difference between the right and left sides. Generally, too, the upper arm and the upper leg show a greater amount of involvement. This, however, does not hold true in regard to the severity of the involvement.

Difficulty in swallowing was noted in forty-two cases at the initial examination. Respiratory difficulty was noted in twenty-seven cases. Difficulty in both deglutition and respiration was present in seven cases. Here, again, these figures would undoubtedly have been larger if the examinations had been made during the acute stage.

Double vision had been noted in two cases; in one there was considerable involvement of one leg and in the other very little weakness was present.

SEVERITY

The method employed in grading muscle power is the one used since the beginning of the Harvard Infantile Paralysis Clinic in 1916. Since the workers have all been trained by the same director of physical therapy and the examinations have been checked by her at regular intervals, the variations in the examinations by the different workers should be very small.

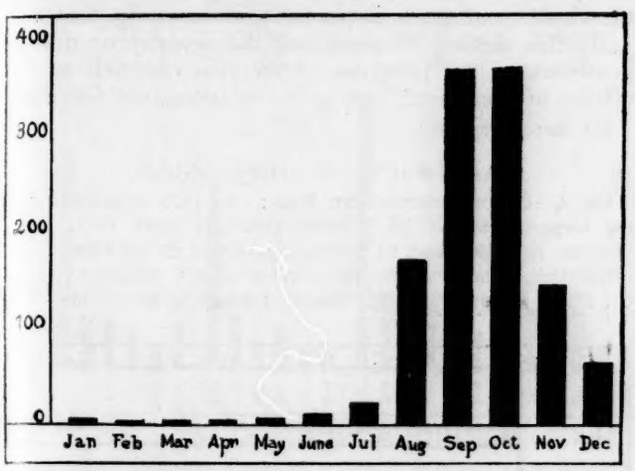

Fig. 2.—Number of cases by months in Massachusetts during 1927.

The muscles are graded as follows:

1. Normal: A muscle that is able to carry out its normal test.
2. Good: A muscle that can overcome gravity and some resistance but not the normal test.
3. Fair: A muscle that can overcome gravity but not resistance.
4. Poor: A muscle that can carry out its action when gravity is eliminated.
5. Trace: A muscle that can be felt to contract but in which no movement of the part can be accomplished.
6. Gone: A muscle in which no contraction can be felt.

A study of the severity of the condition in the different parts of the body brings out a number of interesting facts.

TABLE 1.—*Distribution of Paralysis and Involvement of Abdomen, Back, Neck and Face*

Distribution of Paralysis in Arms and Legs	Number of Cases	Percentage of All Cases Examined	Cases with Stated Distribution of Paralysis Showing Involvement of: Abdomen, per Cent	Back, per Cent	Neck, per Cent	Face, per Cent
No arm or leg	22	5.5	54.5	18.2	63.5	95.5
Both legs	163	37.4	92.5	62.5	55.7	4.3
One leg	66	15.3	90.0	55.0	51.6	11.7
Both legs and one arm	37	8.5	94.6	59.5	86.5	13.6
Both arms	6	1.3	100.0	100.0	50.0	0
One arm	22	5.5	72.7	27.3	59.0	13.6
Both arms and one leg	6	1.3	83.4	50.0	100.0	0
One arm and one leg	15	3.4	80.5	46.6	53.4	0
Both arms and both legs	63	14.4	95.3	81.0	81.0	7.9
Total	400	91.7*	89.0	58.5	62.3	12.0

* Cases examined, 436.

In considering the neck, back and abdominal muscles, it may be seen by figure 5 that no muscles are totally paralyzed, and also that in the neck and back none are graded as low as "trace." There is only 0.5 per cent of paralysis graded as "trace" in the abdominal muscles. Since more than one muscle is concerned in the examination of these parts, I believe that it is possible that certain muscles in these groups may be totally paralyzed. This cannot be determined by examination.

No great difference is seen in the comparative severity of involvement of the upper and lower arms. It is interesting that while the upper leg shows a greater amount of involvement, the total paralysis in the upper leg is only 0.6 per cent as compared to 7 per cent in the lower leg.

TABLE 2.—*Order of Frequency of Severe Paralysis and General Involvement of Muscles of the Arm*

Muscle	Frequency of Severe Paralysis*: Order	Per Cent Severely Paralyzed of All Examined	Frequency of Involvement: Order	Per Cent Involved of All Examined
Anterior deltoid	1	3.0	1	25.6
Posterior deltoid	2	2.7	2	24.4
Clavicular pectoralis major	3	2.4	11	19.0
Sternal pectoralis major	4	2.1	9	19.5
Biceps	5	1.6	8	20.0
Latissimus dorsi	6	1.5	7	20.5
Triceps	7	1.4	3	21.6
Rhomboids	8	1.4	6	20.5
Supinator brevis	9	1.2	12	18.4
Extensor carpi radialis	10	1.2	19	16.0
Extensor carpi ulnaris	11	1.2	20	16.0
Opponens pollicis	12	1.2	17	16.4
Abductor pollicis	13	1.2	14	16.5
Flexor carpi radialis	14	1.0	16	16.0
Pronators	15	0.9	23	14.4
Flexor carpi ulnaris	16	0.9	18	16.0
Thumb extensors	17	0.9	21	15.5
Serratus magnus	18	0.9	10	19.3
Outward rotators	19	0.9	15	16.5
Finger extensors	20	0.8	22	15.0
Upper trapezius	21	0.8	13	17.0
Lumbricales	22	0.7	28	13.0
Middle trapezius	23	0.7	4	21.0
Lower trapezius	24	0.7	5	20.5
Flexor profundus digitorum	25	0.6	27	13.4
Palmar interossei	26	0.6	24	14.4
Flexor sublimis digitorum	27	0.5	29	12.6
Dorsal interossei	28	0.5	25	14.0
Thumb flexors	29	0.5	26	14.0

* Severe paralysis includes the grades of "gone" and "trace."

COMPARISON OF THE ORDER OF SEVERITY AND THE ORDER OF FREQUENCY OF INVOLVEMENT

In the study of the severity and frequency of involvement of the arm muscles, the deltoid is seen to be the most severely as well as the most frequently involved muscle. This fact was true also in a study of the cases

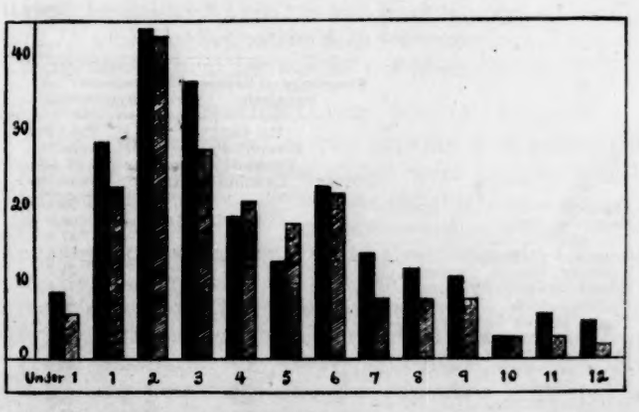

Fig. 3.—Number of cases according to sex and age at time of admission: black, males; shaded areas, females.

between 1916 and 1924, although the posterior deltoid came first in order between 1916 and 1924. The deltoid also showed a higher percentage of involvement in the 1927 cases than in those in the years from 1916 to 1924. The pectoralis major comes next to the deltoid in order of severity in 1927, while from 1916 to 1924 the opponens pollicis comes between these two. After this there is considerable variance in the severity and frequency of involvement between the 1927 cases and those of the years 1916 to 1924.

In the study of the leg muscles, the anterior tibial was found to be the most severely involved in 1927 as well as in the years 1916 to 1924. While it is twelfth in the list in frequency in 1927, it is seventh in order from 1916 to 1924. The quadriceps, which is next to last in the order of severity, is the most frequently involved of all leg muscles. This also is true of the cases from 1916 to 1924. The quadriceps is more than twice as frequently involved as any of the arm muscles.

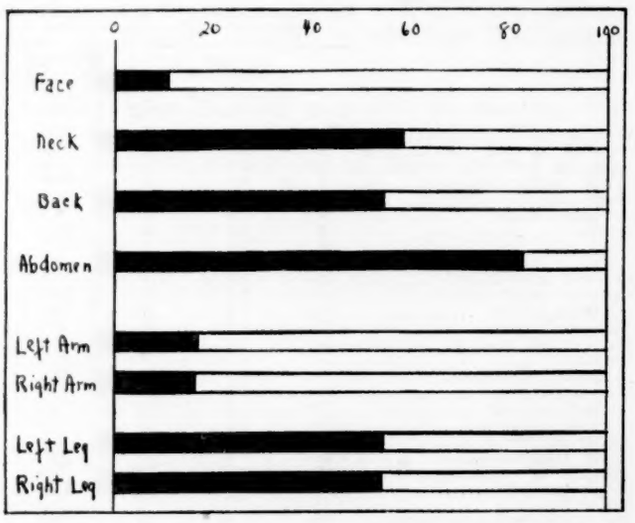

Fig. 4.—Percentage of involvement in different parts of the body in 436 cases examined: solid black, involved; outline, normal.

TOTAL SEVERITY

To estimate the total severity of an epidemic is difficult since cases vary so widely in their severity of involvement. I have, however, attempted in this study to represent the total amount of involvement numerically. In order to arrive at this figure the different grades of weakness have been given numerical values; that is, muscles rated as "gone" are represented by 5, those rated "trace" by 4, "poor" by 3, "fair" by 2, and "good" by 1. Thus, the total of all the figures representing the involved muscles of the body will roughly represent the average severity of the epidemic. In 1927 the severity is represented by 57.4. It will be seen in figure 6 that in 1925 and 1926, nonepidemic years, the total average severity was considerably greater than in 1916 and 1927, which were epidemic years, and was still greater than in 1920, during which there was a moderate epidemic.

TABLE 3.—*Order of Frequency of Severe Paralysis and General Involvement of Muscles of the Leg*

Muscle	Frequency of Severe Paralysis: Order	Frequency of Severe Paralysis: Per Cent Severely Paralyzed of All Examined	Frequency of Involvement: Order	Frequency of Involvement: Per Cent Involved of All Examined
Anterior tibial	1	17.4	12	53.4
Posterior tibial	2	15.7	11	54.9
Peroneals	3	14.1	14	47.6
Extensor proprius hallucis	4	12.8	13	50.3
Extensor longus digitorum	5	12.2	10	55.7
Flexor longus digitorum	6	9.3	15	47.4
Gastrocnemius	7	8.8	6	58.7
Flexor longus hallucis	8	7.7	16	46.7
Outer hamstrings	9	7.6	7	58.4
Inner hamstrings	10	6.9	9	56.5
Short toe flexors	11	5.8	17	45.9
Hip adductors	12	5.4	4	59.3
Hip flexors	13	3.4	5	58.8
Gluteus maximus	14	3.2	3	60.0
Tensor fasciae latae	15	2.6	8	57.6
Quadriceps	16	2.1	1	64.5
Hip abductors	17	1.8	2	64.0

SUMMARY

The method described in this paper makes possible an accurate comparison between the distribution and severity of paralysis in different cases or groups of cases of infantile paralysis.

Analysis of a large number of cases brings out some apparently constant differences between the frequency and the severity of involvement in different muscle groups and in different parts of the body, a knowledge of which is of great importance in handling the case.

By this method of recording the severity of muscle involvement, the progress of the case, as well as the results of treatment, can be more accurately followed.

535 Beacon Street.

ABSTRACT OF DISCUSSION

DR. C. C. CHATTERTON, St. Paul: In 1926 Minnesota had the largest epidemic of infantile paralysis since 1908. That year we had 980 cases of infantile paralysis in the state. The interesting thing was the fact that it was a country disease. St. Paul, Minneapolis and Duluth, containing about one third of the population of the state, had only 10 per cent of the cases. There was marked involvement of the upper extremities and the chest, spine and abdomen in the cases I examined. Of twenty-six boys who made application to the state hospital for crippled children, nineteen were suffering from paralysis of the upper extremity, leaving only six who had either total paralysis or partial paralysis of the lower limbs. I think that is extremely interesting. A great number of the patients were very ill, and were completely paralyzed in the beginning, but made practically a recovery after they were admitted to the state institution. The upper extremity was involved more frequently than we have ever seen in any other epidemic. Another interesting thing was that in one community in Minnesota two picnics were held on the same day. About 200 people attended the picnics, and some forty children became involved with poliomyelitis.

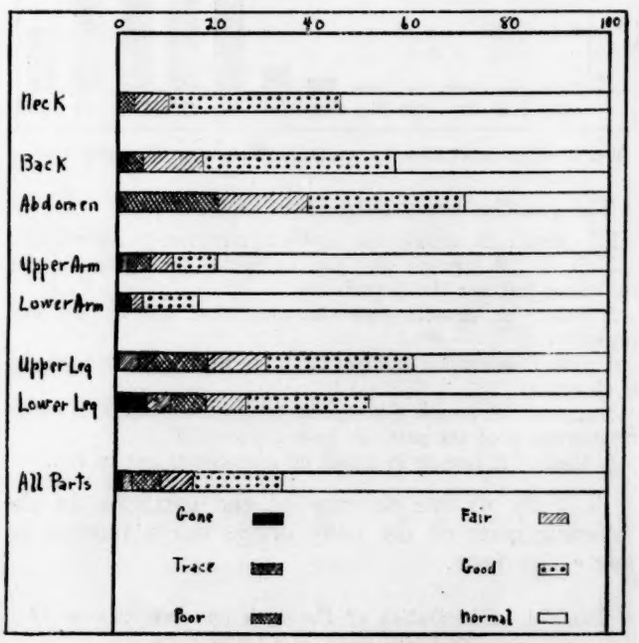

Fig. 5.—Percentage of muscular involvement with each grade of paralysis in different parts of the body: abdomen, 0.5 per cent trace; upper arm, lower arm and upper leg, 0.6 per cent gone.

DR. C. B. FRANCISCO, Kansas City, Mo.: In 1927 there were about eighty-five cases of infantile paralysis reported in Kansas City of about the usual type and the usual severity, possibly with not so many deaths as in the previous epidemics. The percentage of occurrences fell off, as it has always done, in December. In January of this year I saw five cases of typical infantile paralysis. Winter had begun and everybody was feeling that the epidemic was over. One of these patients recov-

ered without any residual paralysis. Two had later bad residual paralysis involving three extremities in one and four extremities in the other, the arm more than the leg. Another patient had a complete paralysis of one arm. I had never seen but two cases before that occurred during the winter. I remember that on three or four occasions the parents stated that the paralysis began in the winter. I was rather inclined to think that it had been overlooked, having perhaps occurred before. These were typical cases that went through the usual course of average severity with the average termination.

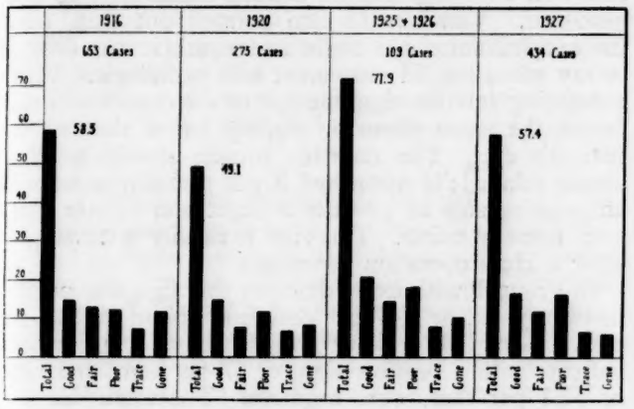

Fig. 6.—Average extent and severity of paralysis.

DR. A. T. LEGG, Boston: It is interesting, of course, to see how epidemics vary so much in their involvement and severity of attack, and it is further interesting to note that the quadriceps are so frequently involved but so slightly paralyzed. It is, I think, always true that the anterior and posterior tibia are the most severely paralyzed of the lower leg.

OCULAR SIGNS IN ONE HUNDRED UNSELECTED CASES OF GOITER*

T. B. HOLLOWAY, M.D.
W. E. FRY, M.D.
AND
HAZEL A. WENTWORTH, B.A.
PHILADELPHIA

The original thought that prompted this study was whether the modern methods of perimetry would elicit any visual field defects in the toxic cases of goiter; changes that might be of service in the individual case, or possibly slighter changes that could be determined only after the study of a group of cases.

In the early part of the series, certain clinical manifestations were not noted as a routine; later on the signs and symptoms referred to below were checked with each patient, but even with this care one sign would be overlooked occasionally. As many of the ocular signs associated with goiter have fairly broad borderlines, the incidence of any of these might be expected to vary considerably according to the observations of various clinicians. With these facts in mind, it was decided to note first by inspection whether this or that sign was present, and then to check up our observation by actual measurements when this could be done. Further, all of these patients were examined under identical conditions. For this purpose a private examining room was used and each of the contributors carried out certain observations on each patient. Dr. Holloway and Dr. Fry made all the observations except the perimetric work, which was done entirely by Miss Wentworth. If a question of doubt arose as to a measurement or the existence or absence of a sign, this was checked up by the other observer. Many of the observations were made immediately after the admission of the patients and before the goiter was definitely classified as to type. All the patients were observed at the University Hospital in the services of Dr. C. H. Frazier and Dr. Alfred Stengel; most of them were from the surgical wards of the former.

All the signs and symptoms referred to have been grouped according to the classification used in the surgical wards:

1. Hyperplastic toxic, subdivided into (*a*) those with exophthalmos and (*b*) those without exophthalmos.
2. Toxic adenoma.
3. Nontoxic cases.

Group 1 comprised fifty-seven cases, subdivided into (*a*) twenty-nine cases, and (*b*) twenty-eight cases; group 2, twenty-two cases, and group 3, twenty-one cases.

AGE AND SEX

Of the patients in the hyperplastic toxic group with exophthalmos twenty-three were females and six males. The youngest patient was 18 years of age, the oldest 62; the average age was 33.8 years.

In the hyperplastic toxic group without exophthalmos, comprising twenty-eight, all were females. The youngest and oldest patients were 18 and 59 years, respectively, while the average age was 35.1 years.

The toxic adenoma group was made up of twenty-two females and the average age was 49.6 years. The youngest was 25 and the oldest 59 years.

There were fifteen females and six males in the nontoxic group; their average age was 42.1 years. The youngest was 25 and the oldest 59.

The ratio of male to female in the hyperplastic toxic group was 1 to 8.5; in the two toxic groups it was 1 to 12.2, while in the whole series it was 1 to 7.03; the incidence for females was 88 per cent.

OCULAR ROTATIONS AND MUSCLE BALANCE

With the exception of two patients with ocular palsies, the rotations of the globes were practically full, although in seven or eight cases the rotations, especially in a lateral direction, were somewhat less than in the average normal patient. All of these instances occurred in the toxic group. Unfortunately, no notations were made concerning two signs referred to by Suker. The first of these may be described as follows: When gentle fixation of the lower lid is made while the eye is looking downward and the patient is requested to look upward while traction is maintained on the lower lid, the globe will be observed to ascend in an unsteady excursion. The second he referred to in 1917 as "deficient complementary fixation in lateral eye rotations."

The muscle balance was tested solely for distance; the Maddox rod was used. The results were essentially the same in the toxic and nontoxic groups. Thus, in fifty-seven examinations among the toxic patients in groups 1 and 2, eleven had an exophoria of 2 degrees or more, or 19.3 per cent, and five had an esophoria of 2 degrees or more, or 8.8 per cent. Sixteen examinations in the nontoxic group disclosed three with an exophoria of 2 degrees or more, or 18.7 per cent, and

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* From the Department of Ophthalmology, University Hospital, University of Pennsylvania.

* Read before the Section on Ophthalmology at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 13, 1928.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the authors' reprints. A copy of the latter will be sent by the author on receipt of stamped addressed envelop.

one with an esophoria of 2 degrees or more, or 6.2 per cent. As to hyperphoria, fourteen patients in the toxic groups had a hyperphoria of 0.5 degree or more, or 26 per cent, while in the nontoxic group, five, or 31.2 per cent, had a hyperphoria of 0.5 degree or more.

EXOPHTHALMOS

As unmistakable as exophthalmos may be when it is well established, the fact remains that in certain instances it may be difficult to say whether it is actually present.

Whitnall states that normally the summit of the cornea is just touched by a ruler held vertically against the superior and inferior orbital margins, but the prominence varies in individuals according to age and state of health. He quotes Ambialet, who found that in 85 per cent of living patients the summit is in front of the vertical axis. There are a number of conditions that may make the decision difficult; probably the most frequent is facial asymmetry, a decidedly common occurrence. How often in our routine clinical work do we find ourselves uncertain as to the prominence of one eye, and when we revert to the exophthalmometer we find that the prominence of the two eyes is the same or possibly that of the unsuspected eye a trifle the greater.

Aside from facial asymmetry or skull deformity, myopia or certain conditions of the lids and ocular paralysis may influence the apparent prominence of the globe. These are the facts that vitiate, to a certain extent, general hospital reports made in various services by observers of widely different clinical experiences, from interns to chiefs.

In the hyperplastic toxic group exophthalmos was regarded as present in twenty-nine cases, or 50.9 per cent, and absent in twenty-eight instances, or 49.1 per cent. The eyes of twelve of the patients in the group were under 14.5 mm. by Hertel measurement, and none of these had been previously noted, by inspection, to have exophthalmos. The eyes of fourteen measured from 15 to 15.5 mm. and four of these, 28.6 per cent, had been regarded as having exophthalmos. In eight the measurements were between 16 and 16.5 mm., and five of these, or 62.5 per cent, had been placed in the exophthalmic group. In eight patients the eye measurements varied between 17 and 17.5 mm., and five had been regarded as having exophthalmos. In fifteen patients the eye measurements ranged from 18 to 24.5 mm., and all of these had been noted as positive. In other words, our first positive observations coincided with a Hertel measurement of from 15 to 15.5 mm. Between 16 and 17.5 mm. we noted as positive 62.5 per cent of the patients, while all were regarded as exophthalmic when the exophthalmometer reading was above 17.5 mm.

Among the twenty-one patients with toxic adenoma, no record was made in one instance, and in another it was thought that the patient had a slight or questionable exophthalmos. In this patient the Hertel measurements were 13.5 and 14 mm.; the palpebral fissures were equal and measured 13 mm., and there was a marked von Graefe sign. In other words, from observation of the eyes alone this group would show an exophthalmic incidence of 4.8 per cent, with 95.2 per cent negative. The highest bilateral measurements were between 16 and 16.5 mm. with the exophthalmometer.

In the nontoxic group, none of the patients were regarded as exophthalmic to inspection. The greatest prominence of the eyes measured between 16 and 16.5 mm.

VON GRAEFE'S SIGN

Lack of coordination between the movement of the upper lid and the elevation or depression of the visual axis or plane is also susceptible of variable interpretation. In his original description von Graefe stated that the usual coincident following of the upper lid was almost entirely held up or reduced to a minimum in exophthalmic goiter. So it is in the excessive cases, but there are other instances in which the cornea is still well covered that, we believe, illustrate this phenomenon. Von Graefe also pointed out that, when the exophthalmos was slight and equal, it was difficult to say when the lid movement was pathologic. When examining for this sign, the eye of the observer should be on the same plane or slightly below that of the patient's eye. The frontalis muscle should be completely relaxed; if contracted it will probably accentuate an existing sign or produce a slight von Graefe when none actually exists. This sign is readily demonstrable after a Hess operation for ptosis.

In group 1 with exophthalmos, this sign was present in twenty-six, or 89.7 per cent, and absent in 10.3 per cent. Group 1 without exophthalmos had nineteen patients with a positive sign, or 67 per cent, and nine, or 32.1 per cent, were negative. The totals for this group were: positive, forty-five, or 78.9 per cent, and negative, twelve, or 21.5 per cent. If these be added to the fifteen positive cases, 68.2 per cent, and the seven negative cases, 31.8 per cent, in the toxic adenoma group, our total for the toxic cases would be sixty positive and nineteen negative, or 75.9 and 24.5 per cent, respectively. Among the nontoxic cases, seven, or 35 per cent, were positive and thirteen, or 65 per cent, were negative. We failed to record our observation in one case in this group. It is interesting to note that, among the sixty-seven patients showing positive signs, the phenomenon was unilateral in eight instances, or 11.9 per cent. Four of these occurred in groups 1 and 2, and four in group 3.

DALRYMPLE'S SIGN

Dalrymple's sign has been confused somewhat in the older literature with Stellwag's sign. R. R. James, in his British Masters of Ophthalmology Series, quotes Mr. Fleming as saying, "Naturally Dalrymple explains the retraction of the upper lid as due to spasm of the levator palpebrae, as Müller's muscle had not at that time been discovered (1884)." The retraction of the upper lid is the condition usually referred to as Dalrymple's sign, but we believe, with A. Hill Griffith, that the sign should be made to include the lower lid, for among our observations were instances in which no other interpretation was possible. Griffith stated: "I do not know if retraction of the lower lids is at all common, but I have not seen it mentioned in any reported cases." If we consider the cause probably most frequently connected with this sign, there is no reason why the lower lid should not be affected, but to a less extent, as our clinical experience seems to indicate.

While space will not permit a satisfactory discussion of the various signs referred to in this contribution, it seems proper to mention here what has been described at times as Kocher's sign. This is a retraction of the upper lid when the patient fixes a stationary object, or a convulsive momentary retraction of the upper lid when a vertically moving object is fixed. While no statistical record was kept in our series, we are convinced that the first mentioned phenomenon is frequently seen, especially in the toxic patients with well

defined exophthalmos and Dalrymple's sign. It resembles the cyclic widening of the fissure sometimes seen clinically, of course without the repetition. In group 1 with exophthalmos, this sign was positive in nineteen, or 65.2 per cent, and negative in ten, or 34.8 per cent, while in group 1 without exophthalmos, the positive cases fell to seven, or 25 per cent, with a consequent increase in the negative to twenty-one, or 75 per cent. The total for group 1 was positive in twenty-six, or 45.6 per cent, and negative in thirty-one, or 54.4 per cent. In one instance it was unilateral. Group 2 provided three positive cases, or 13.6 per cent, and nineteen negative, or 86.4 per cent. These figures were similar to those in the nontoxic group in which four were positive, 19 per cent, and seventeen were negative, 81.5 per cent.

WIDTH OF PALPEBRAL FISSURE

The palpebral fissures were measured with the ordinary millimeter rule with the patient fixing for distance, and after any initial momentary widening had subsided or at least had reached a minimum. In group 1, forty of the fifty-six patients measured had palpebral fissures between 8.9 and 12.9 mm. The highest was 16 mm., and this was found in but one instance. An inequality in the fissures amounting to 1 mm. or more was noted in fourteen instances. In group 2, seventeen patients had fissures that measured between 8 and 10.9 mm.; only one had a measurement as high as 13 mm. In two instances an inequality of 1 mm. or more was noted. In group 3, the fissures measured between 8 and 10.9 mm. in sixteen instances; the greatest width of fissure was between 12 and 12.9 mm. Three instances of inequality of 1 mm. or more were noted, thus making a total of nineteen inequalities among the ninety-eight patients measured, an incidence of 19.3 per cent.

STELLWAG'S SIGN

During the course of one examination it is quite difficult in some cases to speak with certainty concerning the frequency and completeness of winking. When well marked it is outstanding and unmistakable, and even the glare from a strong Mazda electric bulb is well tolerated. On the contrary, one occasionally encounters cases in which the opposite conditions are present; that is, there is a marked increase in the frequency of the winking; this was noted in six instances among the 100 cases in this series.

In group 1 *a*, we regarded Stellwag's sign as present in nine cases, or 31 per cent, while in group 1 *b*, we noted it only five times, or 17.9 per cent. In the cases of toxic adenoma we considered this sign as positive in five patients, or 22.7 per cent. The total for the toxic cases was positive in nineteen, or 23.9 per cent, and negative in sixty, or 76.1 per cent. Among the nontoxic cases we believed the sign to be present in four instances, 19 per cent, and absent in seventeen, or 81 per cent.

MÖBIUS' SIGN

Poor convergence in these cases must show a variable incidence in different statistics. There is no hard and fast rule for definitely fixing the dividing line; many of these patients are difficult to test for this particular purpose and further, certain of them at least must have had a poor convergence prior to the onset of the trouble under discussion.

We included as positive any case in which the convergence near point was greater than 9 cm., as this was measured from the test object to the base of the nose. In group 1, this sign was positive in seven cases, or 10.2 per cent; in group 2, in nine cases, or 40.9 per cent, and in group 3 in three cases, or 14.3 per cent. In the whole series of 100 cases, it was positive in 19 per cent.

SWELLING OR EDEMA OF THE LIDS

In a certain number of cases of goiter, swelling of one or both lids is apparent, more frequently of the upper lid alone. In our observations, when it was slight it manifested itself as a fulness of the upper lid most conspicuous above the tarsus or just encroaching on its upper borders. In the marked cases a fold of skin rested on the lashes.

Observations concerning this condition were made thirty-nine times among the fifty-seven cases of hyperplastic toxic goiter; seventeen times among the twenty-two cases of toxic adenoma, and eighteen times in the twenty-one nontoxic cases. In other words, records were kept in seventy-four of the 100 cases. In group 1 the condition was found in twenty-two cases, or 56.4 per cent; twelve of these were slight, but in ten instances sufficient to cause a fold of skin to rest on the lashes. In group 2, it was present only three times, or 17.6 per cent; twice it was slight and once well marked. In group 3, four instances were noted, or 22.2 per cent; it was slight in three, and well marked in one. In the whole group of seventy-four cases, it was observed twenty-nine times, an incidence of 39.2 per cent. In one case in group 1 *a* there existed well defined overfilling of the capillaries over the tarsus of each upper lid.

PUPILS

In view of the probable relationship of the cervical sympathetic to goiter manifestations, it is only natural that the size of the pupil should be referred to at times.

Our observations were made in a moderate artificial light, but without the light falling directly on the eye. The pupils were allowed to become adapted for distant vision for about one minute and then measured with a lens gage ruled in 0.1 mm. The naked eye will usually detect a difference of a quarter of a millimeter in size between the two pupils, especially with light irides, and will invariably detect a difference of a half millimeter. In group 1 *a* the average size of the pupils was 5.465 mm., the right 5.47 and the left 5.46. In size they varied from 3.8 to 7 mm., the greatest number of eyes occurring in the groups between 5 and 5.9 mm. In eight instances there was a difference of 0.2 mm. or more between the pupils of the two eyes, but in only one a difference of 0.4 mm. In group 1 *b* the average size of the pupils was 5.5 mm., of the right 5.48 and of the left 5.54 mm. In size they varied from 3.5 to 6.9 mm., the largest number of eyes grading in the group between 5.5 and 6.4 mm. In eight instances variation of 0.2 mm. or more was noted between the two eyes, and five of these showed a difference of 0.4 mm. In group 2 the pupils averaged 4.97 mm., the right 5 mm. and the left 4.95. In four cases there was a difference of 0.4 mm. between the two eyes. The greatest difference was 1 mm. In group 3, the average size was 5.34 mm., for the right pupil 5.25 and for the left 5.43. Six cases showed a difference of 0.4 mm. or more between the two pupils; the greatest variation was 0.8 mm.

OCULAR MUSCLE PARALYSIS

At odd times a paralysis of one or more of the extraocular muscles has been noted in conjunction with goiter. The condition varies from an involvement of an isolated muscle to an external ophthalmoplegia.

In our series two patients were observed with paretic muscles, in each instance the superior rectus muscle of the right eye. Both were females, belonging to the hyperplastic toxic group with exophthalmos, and their basal metabolic rates were + 25 and + 40, respectively.

INTRA-OCULAR TENSION

In the literature there are a few references to the condition of the intra-ocular tension in cases of exophthalmic goiter. Thus, Imre has stated that Hertel and Wessely found a hypotension in these cases, which was not in accord with his own observations. He found that either a hypertension or a hypotension might exist, but irrespective of this there was found most regularly a remarkable difference of tension between the right and the left eye.

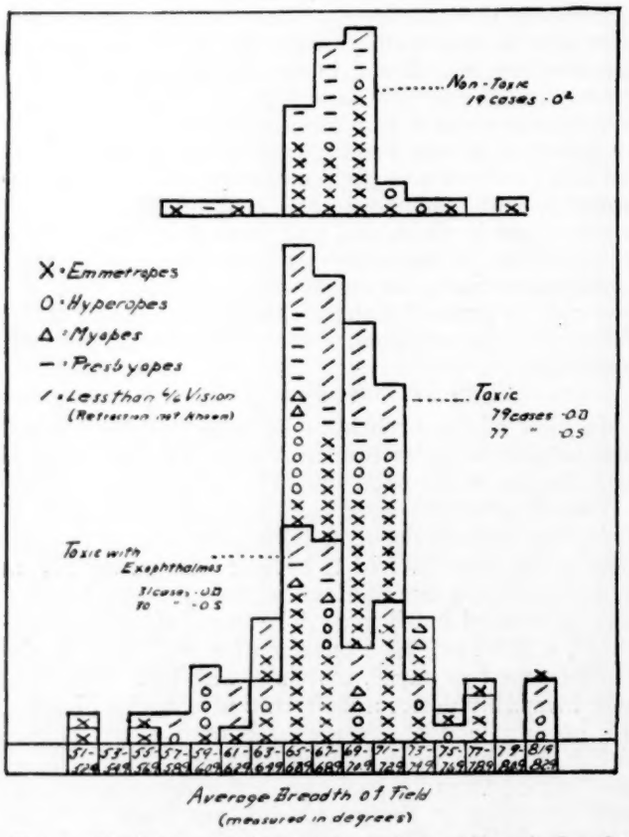

Fig. 4.—Distribution of field sizes for 2 degree white stimulus, for toxic and nontoxic cases.

In our series the tension was measured with the Schiötz tonometer. In all instances the patient was on a table, with one observer manipulating the lids and the other observer the instrument. In group 1, twenty-six patients were tested, fourteen in 1 *a* and twelve in 1 *b*. In groups 2 and 3, twelve and nine patients, respectively, were tested. In group 1 *a* six eyes were between 17 and 19 mm., six between 20 and 22 mm., ten between 23 and 25 mm., and six between 26 and 28 mm. The lowest tension was 17, the highest 28 mm., and the average was 22.4 mm. The tension was the same in the two eyes in six cases, greater in the right in five, and greater in the left in three. The average difference in the unequal cases was 1.8 mm.; the greatest difference, 2.5 mm.

In group 1 *b*, five eyes were between 16 and 19 mm.; eleven between 20 and 22 mm., and six between 23 and 25 mm.; two were 26 mm. The average tension was 21 mm. In eight cases the tension was the same in the two eyes, and in the remaining four cases the higher tension was equally divided between the two eyes. In the latter cases in which the tension was unequal, the average difference was 1.6 mm.; the greatest difference 2 mm. In group 2, two eyes were between 13 and 14 mm.; nine between 16 and 19 mm., and twelve between 20 and 23 mm.; one eye measured 26 mm. The average tension was 19.1 mm. No difference was found in the tension of the two eyes in seven cases, while in the remaining five it was greater in the right eye in two, and greater in the left eye in three cases. The average difference was 2.3 mm. and the greatest difference between the two eyes was 6 mm. Group 3 had seven eyes that measured between 17 and 19 mm. and nine between 20 and 23 mm.; the remaining two were 26 mm. The average tension was 21 mm. Four cases gave identical measurements for the two eyes; in the remaining five cases, the tension was higher in the right eye in two, and higher in the left in three cases. The average difference was 1.8 mm.; the greatest difference between the two eyes was 3 mm.

From the foregoing it will be noted that, of the ninety-four eyes tested, sixty-seven measured 23 mm. or less. Twenty-five patients had the same measurement in the two eyes, while in twenty-two the tension varied and the average difference was less than 2 mm.

OCULOCARDIAC REFLEX

While Aschner was the first to describe the oculocardiac reflex, it is of interest to note that in 1905 Punzo, an Italian medical student, who developed pulsating exophthalmos as the result of trauma while fencing, described the interference to cardiac action when pressure was made on the globe. There have been repeated tests made in exophthalmic goiter and some of the patients have shown a vagotonic, others a sympatheticotonic influence.

In this series the patients were not tested while in the reclining position, nor was a measured weight employed. Gradle has recently referred to his technic in experimental studies. The patients were seated on a chair and pressure was made on the right eye for one minute by the approximated first two fingers and the thumb; the contact was chiefly corneal. While one observer applied the pressure, the other observer recorded the pulse rate.

In group 1 *a*, twenty-six patients were tested; in group 1 *b*, twenty-eight patients, and in groups 2 and 3, twenty-one patients each, a total of ninety-six tests. Three patients were eliminated because the pulse was fibrillating. In group 1 *a* practically no change occurred in the pulse rate in six cases; in twelve cases the pulse rate was decreased four or more beats, while in eight it was increased four or more beats. In group 1 *b* the rate was approximately the same in seventeen cases; decreased four or more beats in eight cases and increased four or more in three cases. In other words, 42.6 per cent manifested no change, 37 per cent a decrease, and 20.4 per cent an increase. In six cases the decrease was six or less, and in six the rate was decreased twenty-two or more beats; the average decrease was 13.5 beats. In six cases the increase was six or less and in five between seven and eighteen; the average was eight beats.

In group 2, no change was apparent in the pulse rate in thirteen cases, 61.9 per cent; five cases exhibited a decrease of four or more, 23.8 per cent, while in three the rate was increased four or more, 14.3 per cent. The average decrease in beats was 5.2, the average increase 9.3. In group 3, no change in rate was noted in ten cases, 47.6 per cent, a decrease of four or more

beats occurred in five cases, 23.8 per cent, while six cases showed an increased rate of four or more, 28.6 per cent. The average decrease was 12.8 beats, the average increase 8.5. It will be noted that the average increased rate is much the same in the three groups, but a greater variation exists in the averages when a decrease was noted.

BRUIT

In 1916 Riesman recorded the history of a case in which a bruit was heard over the globe, and credited the first observation of this sign to Snellen, with subsequent confirmation by Schönfeld, Carrington and Drummond.

In our series this sign was definitely and unmistakably elicited in one patient in the hyperplastic toxic group with exophthalmos. The bruit was bilateral, purely objective, rather loud with a prolonged blow, but not continuous, and was heard most distinctly over the upper and inner aspect of the base of the orbit. In other words, it was noted in 1.75 per cent of the hyperplastic toxic group, or in 1 per cent of the total number of cases.

From our experience we would say that four sounds may be recognized when the bell of a stethoscope is placed on the closed lids over the globe: (1) certain sounds that are doubtless due to the structures anterior to the globe, namely, the lids and probably the conjunctiva; (2) the respiratory sounds; (3) the cardiac sounds, and (4) a true bruit. From our observations they are heard in the foregoing order of frequency.

INTRA-OCULAR CHANGES

The influence of toxic goiter on the lens has been referred to at times in the literature. In this series, the examinations were made without mydriasis and the hand ophthalmoscope alone was used. Our observations would lead us to agree with Ruch that no direct relation exists between goiter and cataract. Fewer changes were noted in group 1 than in groups 2 and 3, probably because of the difference in the ages of the patients.

RETINAL VESSELS

In this series we failed to find any changes in the retinal vessels that were constant enough to warrant the assumption that they were characteristic of the thyroid condition under discussion. Overfilled retinal veins without actual engorgement, and an apparent increase in the size of the arteries, were probably the most frequently noted. In certain cases undue tortuosity of the vessels, and increase and decrease in the size of both sets of vessels were observed, but, as already stated, probably in no greater frequency than would be encountered in a hundred other patients of the same age without thyroid disease. As to angiosclerosis, here again we failed to find any evidence that would point to its greater frequency in goiter. It was most frequently seen in group 2, in which the average age was the greatest.

ARTERIAL PULSATION

A few observers have called attention to the frequency of an arterial pulse in this condition, but we doubt whether it has been accorded the recognition that we believe it deserves. In the first place, in the course of a routine ocular examination, unless the examiner is specifically told that the patient has an aortic regurgitation or signs of glaucoma are found, we question whether the average ophthalmologist definitely notes the presence or absence of an arterial pulse. In the second place, if it is slight, and not of the collapsible type, such as frequently is the case in thyroid disease, it is easily overlooked. Third, it is not always easily detected even by a well trained man, if it is not well marked. With the hand ophthalmoscope ordinary respirations may interfere, and a support for the examining arm, even in the absence of an apparent tremor, is frequently of service.

With these facts in mind when the pulsation was slight or questionable, it was not recorded as present or absent until checked up by the other observer. Whenever possible, transmitted pulsation from an adjacent vein was eliminated. In group 1, it was noted in twenty-three cases, 40.4 per cent, sixteen times as a bilateral and seven times as a unilateral manifestation. In group 2, eleven patients exhibited it, 50 per cent, and in only one instance was it unilateral. In group 3, it was observed bilaterally six times, 28.6 per cent, on four occasions slight, but in the other two quite distinct. Thus, in the toxic groups 1 and 2, it was present

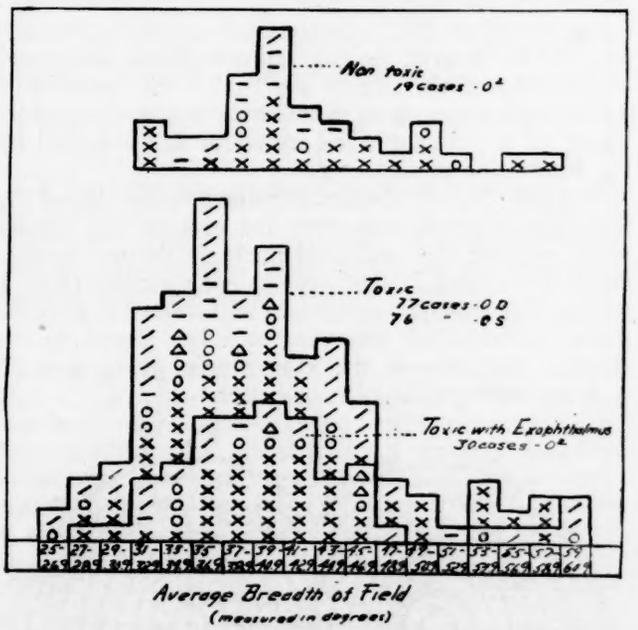

Fig. 6.—Distribution of field sizes for 1 degree of red stimulus, for toxic and nontoxic cases.

in 43 per cent of the cases; if the whole series is considered, an incidence of 40 per cent was found. It is probable that this pulsation may vary in its intensity from time to time, and we can conceive of the possibility of finding a bilateral pulsation in the unilateral cases under favorable conditions.

With these observations in mind, and recalling, as Riesman has suggested, that the vascular phenomena of aortic insufficiency and exophthalmic goiter may be very similar, we do not hesitate to say that, in the absence of signs of glaucoma, the detection of an arterial pulsation demands a determination of the basal metabolism.

[Gifford's, Joffroy's and Rosenbach's signs, as well as the cornea, conjunctiva, lacrimation, and certain intra-ocular conditions are referred to in the complete article.]

VISUAL FIELD STUDIES

In each of the 100 cases fields were obtained for 1 and 2 degree white and 1 degree red stimuli, respectively. In addition to this a thorough search for scotomas was made, 0.17 and 1 degree white and 1 degree

red stimuli being used at a distance of 33 cm., and ⅓ degree white and red stimuli being used at a distance of 1 meter. The standard Heidelberg pigment papers were used as stimuli.[1] The Ferree-Rand perimeter and campimeter attachment under the standard illumination of 7 foot-candles was used for each patient. When searching for scotomas at 1 meter distance the Holloway-Cowan campimeter screen, having an artificial daylight illumination of 15 foot-candles was used.

The average breadth of field, in degrees, in the eight principal meridians was taken as the index of the extent or size of the field.

The cases were classified as toxic and nontoxic, with and without exophthalmos, as determined by inspection. A second classification was made as to the degree of exophthalmos; i. e., none, slight, moderate and marked; and all the groups and subgroups were further classified on the basis of the refractive condition, namely, as emmetropic, hyperopic, myopic, presbyopic, and those having less than 6/6 vision, but in which the refractive error was not known or determined. In each of these groups and subgroups the average, maximum and minimum size of the field was obtained separately for each eye, and for each of the three stimuli used. The actual relationship of the size of the field to the amount of exophthalmos measured in millimeters was obtained by means of a rigid statistical treatment and indicated by the correlation coefficient r.

The distribution of cases in respect to the size of the field was obtained separately for each of the stimuli used, and for the toxic and nontoxic groups, respectively—as shown in the accompanying graphs (figs. 1 to 8). The cases are designated with regard to the condition of refraction according to a key shown on the charts. Included in the emmetropic group are all patients having 6/6 vision or better.

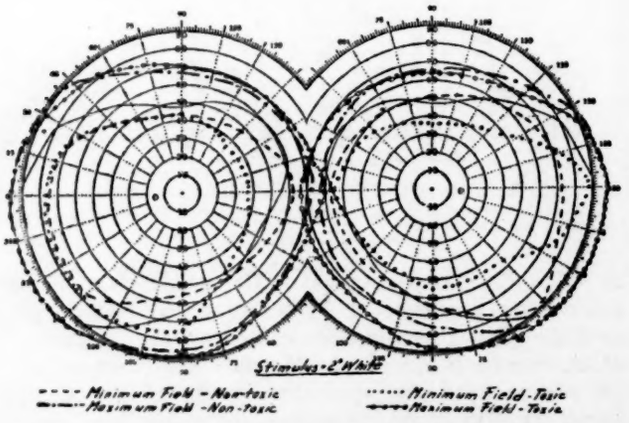

Fig. 7.—Maximum and minimum fields for toxic and nontoxic cases; 2 degree white stimulus.

Examination of the table of averages and of the distribution histograms for the toxic and nontoxic cases (figs. 4 to 6) shows a tendency for the toxic group to have in general somewhat smaller fields than the nontoxic. This is shown both in the relative position of the peaks of the distribution graphs for the two groups and in the range of cases. Although fields may be found in the toxic group equal in extent to the largest field found in the nontoxic group, in the greater number of instances the fields in toxic cases tend to be smaller than those in nontoxic cases, and to extend much lower in the scale of field sizes—to a point, in fact, considerably below that suggested as the borderline between normal and pathologic field sizes by Ferree-Rand and Monroe.

A further survey shows a definite tendency for the size of the field to increase with an increase in the degree of exophthalmos as determined roughly by inspection. This increase, though small, is consistent and is more marked for the form than for the red fields.

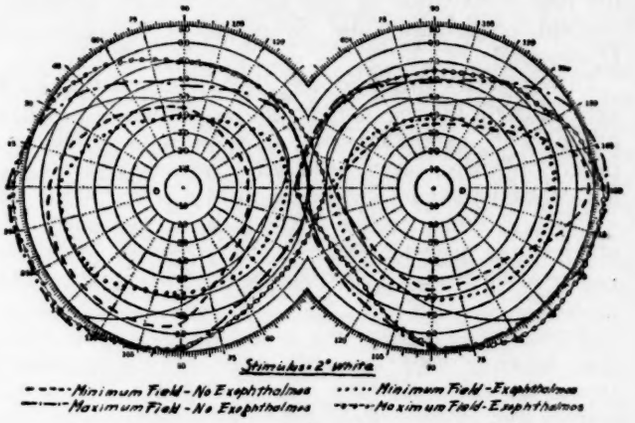
Stimulus-2° White
Minimum Field - No Exophthalmos
Maximum Field - No Exophthalmos
Minimum Field - Exophthalmos
Maximum Field - Exophthalmos

Fig. 10.—Maximum and minimum fields for cases with and without exophthalmos; 2 degree white stimulus.

When statistically treated the correlation coefficient r shows a distinctly positive, though rather low, correlation to exist between the size of the field as indicated by the average breadth in degrees of the eight principal meridians, and the amount of exophthalmos measured in millimeters. The fields for the 1 and 2 degree white stimuli were found to have a correlation with the amount of exophthalmos of $r = +0.25 \pm 0.045$. The coefficient was somewhat lower for the 1 degree red fields, or $r = +0.23 \pm 0.047$. For any one measure of exophthalmos a rather wide range of field sizes is found, while for any given size of field the amount of exophthalmos present varies widely. In other words, although there is a distinct tendency for an increase in the size of the field to accompany an increase in the amount of exophthalmos, the effect of numerous other factors, many of which cannot be controlled, obscures this relationship to such an extent in any given case that prediction as to the amount of exophthalmos accompanying a given size of field, or vice versa, is impossible. The relationship, though positive and observable, has therefore no diagnostic value.

The probable errors of the coefficients, ± 0.045 and ± 0.047, respectively, are sufficiently small to indicate a rather high reliability for the coefficient obtained; i. e., the group of cases examined may be considered as fairly representative of all existing cases, and the coefficient obtained be taken as a reliable measure of the actual relationship to be found between these two measures, however great the number of cases examined.

The relationship between exophthalmos and the size of the field was found to be less for the red than for the form fields, and the reliability slightly less. This is to be expected so far as the size of the field is due merely to an increased protrusion of the eye in relation to the facial conformation. It is also to be expected because of the greater variability from person to person in the size of the color than in the size of the form fields. Variability is shown graphically in the distribution

1. The diameter of stimulus subtending a visual angle of 1 degree at 33 cm. distance and ⅓ degree at 1 meter distance is 5.8 mm.; that subtending a visual angle of 2 degrees at 33 cm. distance is 11.4 mm.

graphs, and mathematically by that measure of variability, the standard deviation or sigma (σ). For the 2 degree white fields $\sigma = 2.49$; for 1 degree white $\sigma = 2.76$; and for 1 degree red $\sigma = 3.61$. This measures the closeness of the grouping of all cases about the mean and indicates that the least difference between individuals is found in the form fields for a 2 degree white stimulus and the greatest difference in the color fields for a 1 degree red stimulus.

A classification of the cases on the basis of refractive errors did not show any consistent variation in the size of field except that the patients with presbyopia had smaller fields on the average than any other group. A survey of the distribution graphs for the toxic and nontoxic cases (figs. 4 to 6), shows these small field sizes, which are apparently due to presbyopia, to have no effect on the relative positions of the peaks of the curves or on their respective ranges, with the exception of the distribution for the red fields, in which case the results are somewhat ambiguous. In other words, the difference in the size of the fields in the toxic and nontoxic group is not an artefact due to the effect of refractive error.

SCOTOMAS

Scotomas were found in seven of the cases. One of these showed a left homonymous scotoma (figs. 15 and 16) including the left blind spot suggestive of a lesion quite separate from the matter under investigation (toxic adenoma). Of the other six cases three showed relative scotomas for a 5.8 mm. red stimulus at 1 meter distance (two cases in one eye alone, one in both eyes). These were found between 5 and 15 degrees from the center of fixation, and the test object did not disappear entirely but became colorless. Of the remaining three all were obtainable at 33 cm. distance with a 5.8 mm. red stimulus, in two cases with a 0.17 degree white stimulus, and in one

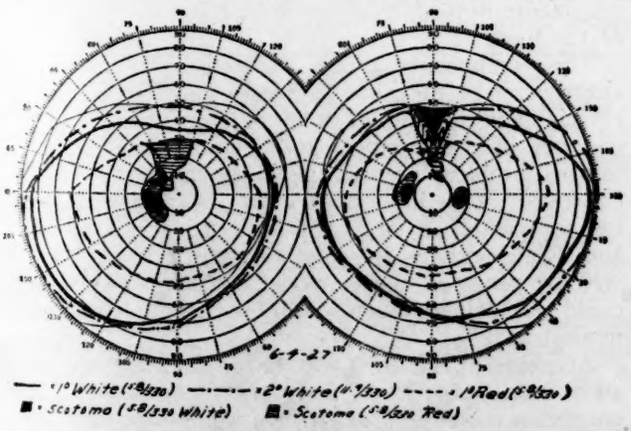

Fig. 16.—Same case two weeks later.

case with a 1 degree white (5.8 mm.) stimulus as well. The latter scotoma was inside of and adjoining the blind spot (fig. 17). Five of the case were toxic; one nontoxic.

Two cases were found in which notches or indentations were obtained in the limits for a 0.17 degree white stimulus at 33 cm. but not for the color stimulus. Both were in the toxic group.

Fourteen cases were observed in which notches or indentations were found in the limits for the 5.8 mm. red at 1 meter distance. As in the scotomas, the test object did not disappear, except in one instance, but became quite colorless. These notches were usually from 5 to 7 degrees in depth, but ranged from 2 or 3 degrees to 12 or 15 degrees in depth. Five of these cases showed notches in both eyes, nine cases in one eye only. Of these, four cases were nontoxic adenomas, one of which showed a slight exophthalmos; six were toxic with exophthalmos (three of the adenoma and three of the hyperplastic group) and four were hyperplastic toxic with exophthalmos.

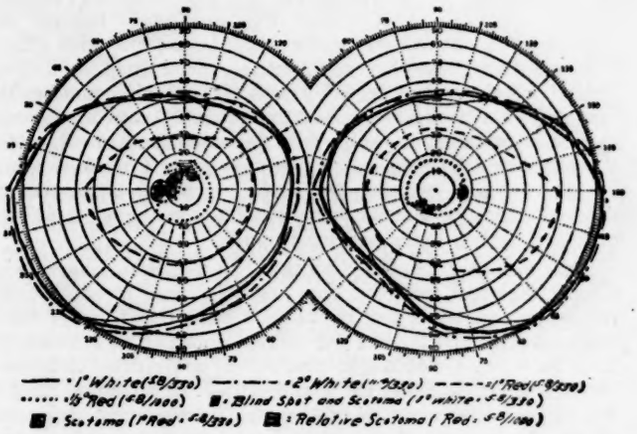

Fig. 17.—Fields showing scotomatous notches in the limits for red at 1 meter.

Of the twenty-three cases, eighteen were toxic and five nontoxic.

Probably certain of the small scotomas referred to were the small relative scotomas known as Schumann's spots, to which Ferree and Rand have referred.

CONCLUSION

In presenting these statistics we have simply endeavored to record observations that were unbiased and free from suggestions. Owing to the character of the signs to which they relate, it is not expected that they will accurately accord with statistics that may be available at other goiter centers. No attempt has been made to refer to the literature of the subject, and place and space do not admit of adequate discussion concerning the various signs. This may be attempted at a later time.

ABSTRACT OF DISCUSSION

DR. WILLIAM L. BENEDICT, Rochester, Minn.: As this is a statistical study of observations in cases of goiter, we must assume that the statements made by the authors are conclusive. Their results are based on accurate measurements, but the selection of cases allows for a wide variation. For instance, not more than half were cases of exophthalmic goiter of the toxic type, and it is in the persons who have the toxic type of goiter that the gross ocular disturbances are found. The author mentions ocular rotation and muscle imbalance in only two or three cases. I think that if the patients examined were farther along in the course of the disease, they would find a much higher percentage of ocular imbalance or paralysis of the ocular muscles. The disturbance of ocular motility is not explained on the basis of exophthalmos alone, but is due to several causes. The exophthalmos that we find in our goiter patients is not dependent on the toxicity. Patients with a high metabolic rate and with other evidences of toxicity may have goiter with little or no exophthalmos. The lid signs may be prominent in cases in which there is little exophthalmos, and not so prominent in cases in which there is considerable exophthalmos.

It is in postoperative cases of exophthalmic goiter that we find the greatest danger to the eyes. We have records of six patients in whom the exophthalmos was malignant; that is, there was no way of reducing the exophthalmos and one or both eyes were lost. This extreme exophthalmos came on after a

functionally successful thyroidectomy. The metabolic rate was practically normal, the tremor, heart rate, and other symptoms had disappeared, but the exophthalmos increased, with ecchymosis of the conjunctivae and swelling of the lids. This could not be reduced by the administration of any drug. One condition which I think the authors did not mention and which I think should be further investigated is the change in accommodation. Glasses made before the onset of the severe toxic symptoms often are not satisfactory after the onset of the symptoms, and we often find that it is practically impossible to get satisfactory refraction during the period of the greatest toxicity, or even shortly after the operation. Retinal and choroidal changes are frequently found in patients with goiter. I do not know that they are relatively more frequent than in normal individuals but certainly patients with high toxic goiter are very apt to have choroiditis, probably due to lowered resistance to infection. Cases of thyroiditis and tumor of the thyroid should be included in this study, and I think it would be interesting to compare the ocular conditions in persons in different stages of toxicity, in those who have the nontoxic type of goiter, and in those who have tumor.

DR. GEORGE F. SUKER, Chicago: In the main, I agree with the investigations that have been made, but wish to suggest that the hemianopic fields that the authors have found are probably central lesions and are not due to any contortion or interference with the chiasm that might result from association of activity between the thyroid and the pituitary body. The second point is the correct interpretation of the von Graefe sign. It is not simply the lagging of the upper lid in the downward rotation of the eye but the hesitating manner in which the lid follows the downward rotation of the globe. One can have the so-called von Graefe sign in moderate cases of exophthalmos from any cause because of mechanical conditions. As the eye rotates downward the lid first slips uphill and then follows the eye synchronously and evenly. In highly toxic goiter we frequently see corneal lesions that are not due to malignant exophthalmos per se but to interference with sensation, resulting from the involvement of the fifth nerve on a toxic basis. I have had several cases in which there was absolute corneal anesthesia, and one patient developed bilateral corneal complications of the ulcerative type. As far as the particular sign that the authors mentioned is concerned, which I described six or seven years ago, namely, lateral compensatory rotation and fixation of the eye, it is as often present in exophthalmic goiter of the toxic type as is the von Graefe sign. I wish to add this one point with reference to what Dr. Benedict said in regard to malignant exophthalmos in preoperative cases. I have recently had a case in which both eyes were lost because of interference with the fifth nerve, giving bilateral corneal ulceration as a result of inability to close the lid. It must always be borne in mind in making these ocular examinations in patients with exophthalmic goiter, whether of the toxic type or not, that a close relationship exists between the sympathetic nerves and the other nerves of the eye.

DR. W. E. FRY, Philadelphia: Dr. Benedict mentioned that the patients were not particularly selected in regard to grouping for exophthalmic goiter and the nonexophthalmic type. These patients were examined as they presented themselves in the clinic of the University Hospital, and we have taken them serially as they came without endeavoring to select the cases which were of the most toxic type.

"Cirrhosis."—The liver in portal cirrhosis is increased in density. It is hard and its elasticity is diminished. The capsule may be decidedly thickened. The surface of the liver is granular. This granular appearance is the result of grayish opaque depressions, which prove to be continuous with bands of connective tissue in between which yellowish or reddish brown ovoid elevations occur. These are the so-called hobnails. It was the tawny yellow color of these elevations that led Laënnec to give the name of "cirrhosis" to the condition. He believed that the nodular elevations were new growths. These elevations are usually found uniformly throughout the liver. They may vary in size from that of a pinhead to that of a pigeon's egg.—Piersol, G. M.: The Cirrhoses of the Liver, *Memphis M. J.*, December, 1928.

THE HEALING OF WOUNDS AS DETERMINED BY THEIR TENSILE STRENGTH *

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JOSEPH W. SOOY, M.D.
AND
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NEW HAVEN, CONN.

An uncomplicated incised wound presents for analysis the simplest form of disease, for the injury is primarily mechanical and finished and the reparative process is not subject to the interference of further injury. It also falls well within the definition of a "self-limited disease" given by Jacob Bigelow,[1] as one "to which there is due a certain succession of processes, to be completed in a certain time; which time and processes may vary with the constitution and condition of the patient, and may tend to death, or to recovery, but are not known to be shortened, or greatly changed by medical treatment."

Recovery in the case of a wound accomplishes two main purposes: the reconstruction of the gross continuity of the tissue involved and the restoration of its function. When the latter is that of weight bearing or of the transmission of physical stress, it is accomplished in the greater part by the reestablishment of the continuity of the tissue and the solidification of the scar up to the point at which it is able to bear the stress imposed on it. This is brought about in the main by the multiplication of fibroblasts and their maturation into the adult cell of connective and osseous tissues. When the function as well as the structure of the type cell is more highly specialized, as in the parenchymatous organs and the central nervous system, function may not be restored by the healing of the wound, though the gross continuity is reconstructed by the multiplication and maturation of cells responsible for the framework of the tissue.

This fundamental process, sometimes called that of cicatrization or fibrosis, is perfectly familiar to both the clinician and the histologist but only qualitatively so, for methods of measurement and accurate data applicable to this problem are not available or have not been employed. Our knowledge, then, concerning the healing of wounds is largely impressionistic and empiric, and, while perhaps sufficient for most purposes, might well be rendered more precise and scientific if data could be obtained which would be susceptible of mathematical analysis.

Attempts in a limited way have been made to obtain such data. Carrel,[2] in 1910, in the first of several papers on the healing of surface wounds, by measuring the changing surface area made certain important observations. He found that, between the infliction of the injury and the start of the diminution in the area of the surface wound, there was a quiescent period of from one to five days; that such diminution first occurred as a result of what he termed "granular retraction," and that this was soon overlapped by the decrease in size as a result of the ingrowth of epithelium from the edges of the wound. After the epithelium had covered in the

* From the Department of Surgery, Yale University School of Medicine.
* The expense of this investigation has been defrayed by Davis and Geck, Inc.
* Read before the Section on Surgery, General and Abdominal, at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 13, 1928.
1. Bigelow, Jacob: Nature in Disease, Boston, 1854, p. 4.
2. Carrel, Alexis: The Treatment of Wounds, J. A. M. A. 55: 2148 (Dec. 17) 1910.

surface, the scar underwent changes over several months—the period of cicatrization. There was a definite relationship between the size of the wound and the rate of decrease; that is, the larger the wound, the more rapid the contraction. A reverse relationship existed as regards the epidermization; that is, the smaller the wound, the more rapid the ingrowth of epithelium.

Spain and Loeb,[3] in 1916, by a detailed microscopic study of healing surface wounds, without previous

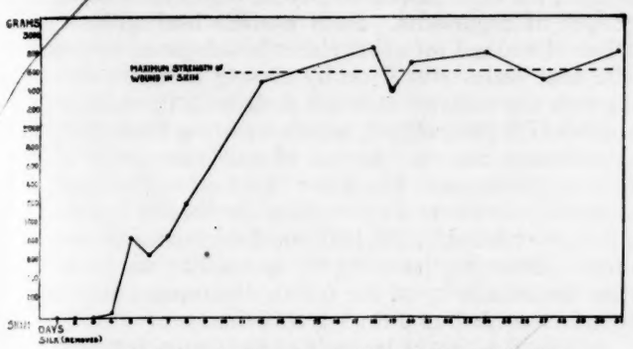

Fig. 1.—Tensile strength of a healing wound of the skin.

knowledge of Carrel's work, arrived at something like the same conclusion; namely, that such a wound healed by contraction of the granular bed and the outgrowth of epithelium, and that the larger the area the more rapid the rate of repair.

Carrel and Hartmann,[4] in the same year, restudied the problem and constructed graphs of the rate of the reparative process which illustrated the fact that this was more rapid at the beginning of the process than at the end, and again that the larger wound healed at a more rapid rate than the smaller. They considered the process of contraction the more important factor.

Inspired by this and working in Carrel's clinic and laboratory, du Noüy[5] developed a mathematical equation by which the rate of healing in any given wound might be expressed, its normal course predicted, and the time of final closure ascertained. In 1919, he[6] restudied this question and developed two equations, the first expressing the rate of contraction alone; the second, a summation of this and the process of epidermization. A constant, which is peculiar to the age of the patient and the initial area of the wound, must be determined in each instance. While Lumière[7] thought that this curve of the healing of a wound could be expressed more simply, it is questionable whether his experiments were sufficiently detailed and controlled to cast doubt on the equation of du Noüy. He emphasized that a coefficient must be determined for each wound which is dependent in great part on the configuration of it.

Having established a normal curve for the surface wound, Carrel and du Noüy[8] and Carrel,[9] in 1921, amplified their previous observations. In particular they studied the latent or quiescent period, which in the dog lasted from five to seven days under the conditions of the experimentation and then ended abruptly. The contraction period started with a maximum velocity. When the wound was protected this latent period was prolonged apparently as long as such protection was complete, while the introduction of irritants served to decrease it even below the normal time. Carrel came to the conclusion that the contraction phase was initiated by an external factor.

Meanwhile Clark,[10] in 1919, using the methods of Carrel and du Noüy, had studied the effect of diet on the healing of surface wounds. While the experiments were few and need confirmation, they suggested to him that the rates of contraction and epidermization were unaffected by diet. The length of the latent period, however, was remarkably dependent on dietary factors. In dogs fed on a protein diet it was practically abolished, while with a fat diet it was notably prolonged.

Another factor of great importance was demonstrated by Ebeling;[11] that is, the influence of the temperature on the healing of a surface wound. Using the curve of Carrel and du Noüy as the normal expectancy of healing, he varied the temperature, and the curves of healing of wounds in the alligator under these variations were determined. It was found that roughly a rise of 10 degrees C. increased the rate twofold, an increment corresponding to the increase in velocity of a chemical reaction produced by increased temperature.

EXPERIMENTATION

It is apparent from this survey of the literature that the quantitative investigation of the healing of wounds has been largely confined to wounds of the skin, where the determinations have been based on the measurement of the surface area. It is also evident and well recognized by the investigators cited that the diminution in

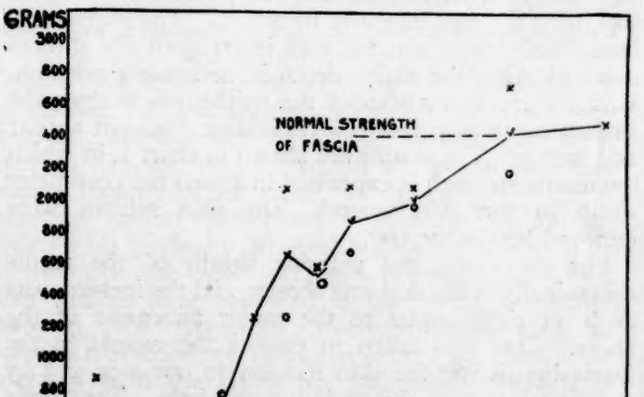

Fig. 2.—Tensile strength of the healing wound in fascia: Two experiments, the one wound being sutured with number 00 chromic twenty-day catgut, the other with number 3 chromic twenty-day catgut.

area is dependent on two processes, one of contraction and one of epidermization. The problem would be simplified if one of these factors could be eliminated and the investigation confined to the other. This has been done by producing incised wounds in the skin, muscle, fascia, stomach and intestine, immediately suturing them and determining the tensile strength of the wound at certain time intervals.

3. Spain, K. C., and Loeb, Leo: Wound Healing, J. Exper. Med. **23**: 107 (Jan.) 1916.
4. Carrel, Alexis; and Hartmann, A.: Cicatrization of Wounds, J. Exper. Med. **24**: 429 (Nov.) 1916.
5. Du Noüy, P. L.: Cicatrization of Wounds, J. Exper. Med. **24**: 451, 461 (Nov.) 1916.
6. Du Noüy, P. L.: General Equation for Law of Cicatrization of Surface Wounds, J. Exper. Med. **29**: 329 (April) 1919.
7. Lumière, A.: Healing of Wounds in Skin, Rev. de chir. **53**: 656 (May-June) 1917.
8. Carrel, Alexis; and du Noüy, P. L.: Cicatrization of Wounds: Latent Period, J. Exper. Med. **34**: 339 (Oct.) 1921.
9. Carrel, Alexis: Cicatrization of Wounds: Factors Initiating Regeneration, J. Exper. Med. **34**: 425 (Nov.) 1921.
10. Clark, A. H.: Effect of Diet on Healing of Wounds, Bull. Johns Hopkins Hosp. **30**: 117 (May) 1919.
11. Ebeling, A. H.: Cicatrization of Wounds: Temperature Coefficient, J. Exper. Med. **35**: 657-659 (May) 1922.

In these experiments dogs were used, being fully anesthetized with ether, operated on under strictly aseptic technic and killed at the completion of the experiment. The tissue that contained the wound was removed, the length of the wound was determined, and its tensile strength was tested on a Scott thread-testing machine.

The variation in successive tests of the same wound, that is, the gross error, is about 250 Gm. or, as will be seen by comparison with the data, from 5 per cent in the

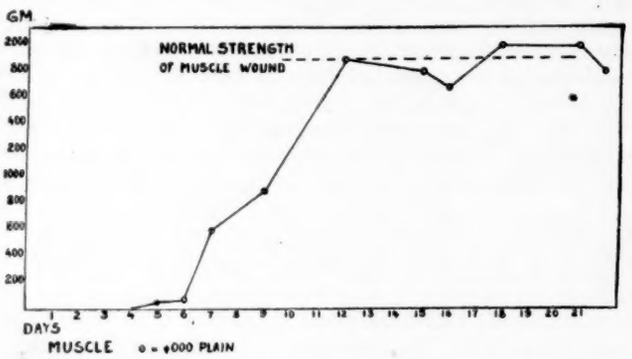

Fig. 3.—Tensile strength of healing wound in muscle: sutured with number 000 plain catgut.

larger values to 30 per cent in the smaller. While this is large, it has been shown by successive checking in various types of wounds in many experiments that the results are sufficiently comparable to render them susceptible of mathematical analysis.

In those experiments carried out on the skin, after as thorough a sterilization of it as possible, an incision was made through its entire thickness. The edges were immediately approximated with interrupted silk sutures so as to bring the entire depth in accurate apposition. Under these circumstances the epithelium bridges the surface so rapidly that epidermization does not appear as a factor. The results are shown in chart 1, in which the tensile strength is expressed in grams per centimeter width of the skin wound. The skin sutures were removed before the test.

For the fascia the anterior sheath of the rectus abdominalis in the dog was chosen, and the incision was made at right angles to the major alinement of the fibers. Care was taken to confine the wound to the fascia by placing the skin incision to one side and by avoiding injury to the underlying muscle. The fascia was carefully approximated with number 00 twenty day chromic catgut in one series and number 3 twenty day chromic catgut in another. The holding force of these, that is, the point at which they tore out at the points of insertion, was less than 700 Gm. per centimeter of incision. There is little if any summation of strength of the suture and wound, for the stretching before the actual giving way tears out the suture. The quiescent period as represented by the composite graph then (chart 2) represents the time up to the fifth day, and the strength during this period is that of the holding power of the sutures.

For the wound in muscle, the sartorius of the dog was chosen; this was transversely divided in its midportion and carefully approximated with interrupted number 000 plain catgut sutures. The sheath, having been divided in its longitudinal axis, was very carefully repaired. The tearing strength of the suture is lower here than in the fascia but the quiescent period is comparable, as shown in chart 3. In computing the tensile strength in a wound 1 cm. in breadth, more error is occasioned here than elsewhere by not considering the thickness of the tissue. The sartorius muscle is, however, of minimal and constant thickness in a dog, so that the observations, which are relative only, may be fairly treated in this manner.

The tensile strength of wounds of the stomach might be expected to show greater variation because of the possibility of infection from the lumen. This, however, is not the case, probably because in the dog's stomach, at least, the high gastric acidity serves to keep down the growth of organisms. Such wounds heal without evidence of marked infection either histologic or otherwise. The first series was done by closing a simple incision through the anterior stomach wall with three layers of number 000 plain catgut, which we know from previous experiments, reported by one of us,[12] disappears within forty-eight hours. The inner layer served to approximate the mucosa and the middle the muscle layers; the outer layer brought the peritoneal surfaces into apposition. The strength during the quiescent period was less than the sensitivity of the testing instrument and therefore is recorded as 0 during this time.

A second series of wounds of the stomach was closed in three layers in a similar fashion with a number 3 twenty day chromic catgut, and consequently the measured strength during the quiescent period represents the holding power of the sutures, which is always that point at which they tear out of the tissues. The return to normal is neither so complete nor so rapid as in the preceding experiment, suggesting that the presence of large amounts of suture material interferes seriously with the healing of the wound.

COMMENT

The quiescent phase which is shown by these experiments to be common to the initial period of healing in all the tissues tested was also observed by Carrel both in the healing of surface wounds and in the culture of tissues in vitro. As has been shown by Robertson,[13] this "lag-period" is a phenomenon not peculiar to highly organized tissues but also occurring in the multiplication of unicellular organisms, such as infusoria and bacteria. It is apparently analogous to, if not identical with, the

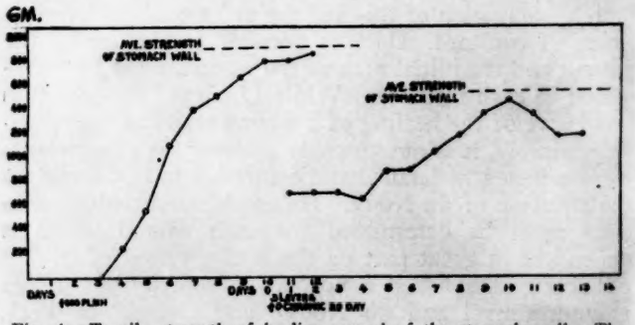

Fig. 4.—Tensile strength of healing wound of the stomach wall. The first curve is that of a wound sutured with number 000 plain catgut, the second, one sutured with number 0 chromic twenty-day catgut.

lag in the so-called autocatalytic curve of growth and in certain chemical reactions. However this may be, the practical significance is very apparent, for it is during this period of from four to six days that the strength of the wound must be artificially reinforced by the use of sutures.

The phase of fibroplasia is equally important, for it is during this time that the strength of the wound is

12. Howes, E. L.: Factors Determining the Loss of Strength of Catgut When Embedded in Tissues, J. A. M. A. **90**: 530-532 (Feb. 18) 1928.
13. Robertson, T. B.: Principles of Biochemistry, ed. 2, Philadelphia, 1924.

developed up to a maximal point, at which it remains for some time. The rapid ascent of the curve from the sixth to the tenth day as expressed in tensile strength has great practica. significance as regards the type of suture used, and the stress thrown on the wound must be adjudicated with this in view.

The phase of maturation, during which the scar solidifies, does not fall within the scope of this investigation. The study of it in relation to the healing of tendon and bone will be of the greatest significance.

The correlation of these phases with the histologic changes is of interest. It is, of course, perfectly well known that the first reaction in a simple incised wound is that of fibrin formation in the blood or plasma exuded between the surfaces, the ancient "agglutination" of the wound. This corresponds largely to the quiescent period. Shortly there appear fibroblasts which grow along this scaffolding and multiply with increasing rapidity until their bulk has filled in the defect and restored the continuity of the tissue. Together with this is a growth of new blood vessels, but it is to be assumed with reasonable safety that the increasing strength of the wound and the contraction of it as seen in surface wounds is in the major part a function of the growth of the fibroblasts. Consequently, this period is called the phase of fibroplasia.

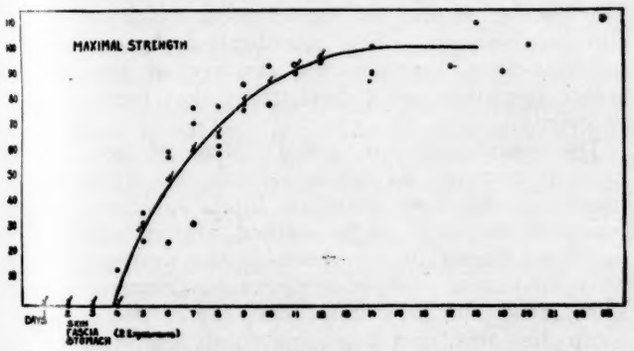

Fig. 5.—The curve of the healing of a wound as expressed by its tensile strength.

SUMMARY

It has been found possible to determine the rate of healing of the simple incised wound for the skin, fascia, muscles and stomach.

The tensile strength of a healing wound is a function of the fibroplastic process.

A curve expressing this shows a lag period of from four to six days and then a phase of fibroplasia, rising rapidly at first and more slowly as it approaches the maximal strength of the wound.

The latter point is attained in from ten to fourteen days.

ABSTRACT OF DISCUSSION

DR. WILLARD BARTLETT, St. Louis: The meaning of what the authors have given us is well illustrated as far as the gastro-enteric tract is concerned by some work done in the Mikulicz clinic at the end of the last century. This work was the first, to my knowledge, that took the problem out of the field of empiricism and put it on a proved basis. In the Mikulicz clinic Klumpski made end-to-end intestinal anastomoses; then he injected water under known pressure into the lumen of the sutured bowel, with the following results: The pressure at the time of operation represents the normal pressure which the intestine will stand. An hour after the operation, it would stand about half this normal pressure before leaking. Then for about two days the pressure did not vary. During this time, just the thread alone, with possibly just a bit of fibrin, was holding the intestine together where it had been sutured and prevented leakage. What happened is no longer surprising in view of what I have just heard. The pressure dropped greatly until the seventh day. What made it drop? Why, during the time that granulation tissue was being deposited around those sutures, the whole tissue was rendered cheeselike in consistency, like a piece of American cheese instead of like a piece of meat, and the stitches tended to cut. It was perfectly simple. Then from the seventh day on, the strength of the bowel increased gradually up to the fifteenth day, when it held at the same level that it did at the time of the operation. I think that is all fairly self-evident. Madelung, at the beginning of this century, studied postoperative wound bursting with eventration of the abdominal contents, and found that wounds have burst up to seventeen days after a laparotomy. That is not far off from what the authors talked about when they spoke of complete union at fourteen days. Also they found that it did not matter what kind of suture material was used; this occurred, as one might expect, after catgut, after silk, and after silver wire had been used. How does one explain it? Granulation tissue was deposited around stitches, which cut through cheeselike tissue, and they found, furthermore, that it did not matter much what form of suture had been used, through and through, or plain. All of this, I think, goes to prove what the authors have said.

OPERATIVE FUSION FOR TUBERCULOSIS OF THE SPINE

REPORT OF THREE HUNDRED AND ONE CASES *

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ROCHESTER, MINN.

The mortality rate in tuberculosis of the spine is high and the patient carries a high potentiality for disability and crippling. Practically all of the many methods of treatment depend on recumbency or support by aid of some sort of apparatus to keep the superimposed weight off the affected area. Seventeen years ago operative fusion, the first real departure from time-honored methods, was advocated. Hibbs,[1] in 1911, reported his operation of fusion of the laminae and spinous processes in cases of progressive spinal deformity, and in the autumn of the same year Albee [2] reported his method of transplantation of a portion of the tibia into the spine for Pott's disease. Since then many articles have appeared in the literature, particularly in the American literature, attempting to establish the actual worth of the procedure. Since the object of both the Hibbs and the Albee methods is fusion of the spine, and since it has been amply proved that either method can accomplish it, I shall not attempt to compare the relative value of the two methods.

RECENT LITERATURE

The reports of Girdlestone [3] in 1919 and 1922, embracing 100 cases, and the discussion that followed, showed clearly that the English observers believed the operation to be satisfactory for adults but of questionable value for children. Stone,[4] in 1920, reported thirty-three cases in children treated by operative fusion, and thirty-two, for comparison, treated by the

* From the Section on Orthopedics, Mayo Clinic.
* Read before the Section on Orthopedic Surgery at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 14, 1928.

1. Hibbs, R. A.: An Operation for Progressive Spinal Deformities, New York M. J. **93**: 1013-1016, 1911.
2. Albee, F. H.: Transplantation of a Portion of the Tibia into the Spine for Pott's Disease, J. A. M. A. **57**: 885-886 (Sept. 9) 1911.
3. Girdlestone, G. R.: A Note on Pott's Disease and Albee's Spinal Graft, J. Orthop. Surg. **1**: 401-415 (July) 1919; The Place of Operations for Spinal Fixation in the Treatment of Pott's Disease, Brit. J. Surg. **10**: 372-379 (Jan.) 1923.
4. Stone, C. A.: Operative and Nonoperative Treatment of Tuberculosis of the Spine: A Comparison, J. Missouri M. A. **17**: 367 (Sept.) 1920.

conservative method. He concluded that ankylosing operations for tuberculosis of the spine in children should not be recommended. The committee appointed by the American Orthopaedic Association to investigate the results of such operations submitted its report in 1921.[5] Ninety-six patients had been examined and, although the committee was evidently favorable to the method, its limitations were realized and the difficulties in prognosticating the end-results in a chronic disease of this nature were emphasized. Baer,[6] in 1922, in reporting a series of fifty cases, concluded that the operation should be used only in selected cases, and that it is of questionable value in infancy and childhood.

In Ireland, Wheeler,[7] in 1922, reported twenty-seven cases. He believed that conservative treatment was best for children, and that in the absence of contraindications adults should be operated on. From France, Calvé and Galland,[8] in 1922, reported on sixteen cases in adults, and concluded that the method was not needed for well-to-do adults who were not likely to be called on for violent effort, and that conservative measures would usually be sufficient. From Scandinavia, Waldenström,[9] in 1924, reported on eighty cases in which the results were favorable; some of the patients were children. He stipulated that the deformity should first be corrected; this was carried out in his cases by means of a plaster cast and rest in bed, and then the insertion of a bone graft.

Sisler,[10] in 1924, reported on a series of cases treated in the Willis C. Campbell Clinic. He stated that the members of the clinic preferred conservative treatment for children and operative treatment for adults. Kidner and Muro,[11] in 1927, reported a series of fourteen cases in which seven patients were treated by operation and seven by mechanical fixation. The patients were selected in pairs as nearly alike as possible as to age, stage of disease, general condition and so forth, and one was treated conservatively and the other by operation. The Hibbs method was used in all the operations. They concluded that the children on whom fusion had been performed required practically as long and as careful after-treatment as those without operation, and so far as they could determine from the limited number of cases the children treated conservatively seemed to do better.

I [12] reported a series of cases in 1917, and my colleague Meyerding [13] reported one in 1920; we felt that the operation should be used for adults whenever the general condition warranted it, but we were inclined to avoid it for children. Hibbs, at the meeting of the American Orthopaedic Association in May, 1928, reported a series of 286 cases in which operation had been performed more than seven years before. More than 80 per cent of the patients were children, and the percentage of cures was 74.6. This is an astonishingly high percentage, and in view of the results of his careful follow-up system and observations we must seriously reconsider our conclusions with regard to operating on children. Although the mortality rate in the traced cases (from seven to fifteen years) was 26 per cent, the operative mortality was only 0.9 per cent. As will be shown, our operative mortality was the same, and the mortality in the cases traced only slightly lower, but our period of observation was from two and a half to fifteen years.

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METHOD OF CLASSIFICATION

Many difficulties are encountered in reporting results in such a disease as tuberculosis of the spine, and a standard of interpreting results on which all are agreed has not been adopted. From the patient's point of view, if the operation has restored or relieved him, it is a success and if his condition is unchanged or worse, it is a failure. If the patient can resume his former occupation, free from symptoms, without any increase in deformity, and if he can live as he did before he was burdened with the disease, the result may be said to be excellent; on the other hand, if the patient has paraplegia, for example, and if after operation the paraplegia disappears except for slight spasticity, and he is able to get about and do some work, it may also be said that the result is excellent. In reporting a series such as this, however, no such latitude is allowed. The relative amount of improvement cannot be taken into consideration. The classification, based on full restoration of function, the severity of the disease before operation being disregarded, has been adhered to strictly.

The operation is not radical. None of the diseased tissue is removed, as can be done so readily in tuberculosis of the knee joint or hip. All that can be reasonably expected of the method, after a living splint has been placed in the spine, is the development of bony ankylosis. Ample evidence has accumulated to show that the operation can, and usually does, accomplish this, and it is now firmly entrenched as a more or less standard procedure in the treatment of tuberculosis of the spine in the adult. The results are not so quickly attained as to warrant allowing it to supersede the older and established methods of splintage and support by the aid of apparatus. These appliances should be used also to prevent strain on new callus formation and thus hasten the ankylosis; they are abandoned only when the patient is free from all symptoms. There is no doubt that under favorable conditions the operation shortens the convalescence, thus saving the patient's time. Although it is generally agreed by orthopedic surgeons that the operation is indicated for adults, there is a difference of opinion as to the advisability of subjecting children to the operation. In well conducted operations the operative mortality is low.

As a basis for the present study, I have classified the results under five headings: excellent, good, fair, poor and fatal. Group 1 comprises patients who are practically well, having been fully restored to their duties and relieved of all symptoms, without the development of abscesses or any appreciable increase of deformity. Group 2 is comprised of patients who are able to earn a living at light work. Improvement is marked, but the patient may occasionally experience some pain in his back and a sense of weakness, without an appreciable increase in deformity. Group 3 includes patients who are probably able to work part time; there may be increase in deformity or the formation of abscesses, but on the whole some improvement. If the

patient works, he may be able to earn enough to live on. Group 4 represents patients who are incapacitated and do not show improvement; deformity is increased and abscesses may form. Group 5 comprises all patients who died, from whatever cause, which is probably a little unfair to the statistics.

SELECTION OF CASES, TYPE OF OPERATION, AND CARE OF PATIENTS

The selection of the cases is important. There is obviously little if any use in performing this type of operation if the disease is widely disseminated or if tuberculosis of the lungs is present; certainly it should not be performed until the lung has healed or the healing is well under control. Likewise, if there is tuberculosis of the kidney this should be eradicated before spinal fusion is performed. The presence of a draining abscess, provided the patient is in good condition, does not contraindicate operation, but the sinus must not be present in proximity to the operative field so that an infected operative wound may result. In children the time element is not so important. For this reason, and because the results in the early cases in children were none too good, I have made it a rule not to subject patients to this operation before the age of puberty. The type of operation usually selected is the Albee or bone-grafting, the graft being placed deep at the base of the spinous process close to the laminae. In some cases, if patients are just recovering from a pulmonary lesion and it is not advisable to subject them to the risk of general anesthesia, the Hibbs operation, under local anesthesia, is performed very satisfactorily. The postoperative care in all cases consists of rest on a Bradford gas-pipe frame for at least six weeks, and often as long as ten or twelve weeks, and the wearing of a brace or a cast for at least one year from the time the symptoms cease. Heliotherapy in the summer, lamps in the winter, and tonics are included in the after-care. A good general dietetic and hygienic regimen is, of course, insisted on.

DATA IN THREE HUNDRED AND ONE CASES

From 1912 to 1925 inclusive, some type of fusion operation was performed on 301 patients with tuberculosis of the spine. In a few cases, because of a double lesion or fracture of the graft, two operations were performed. The bone graft was used in 269 cases, and the Hibbs plastic operation in thirty-two. There were 196 males and 105 females in the series; the average age was 28. The ages in decades were as follows: From 1 to 10 years, sixteen patients; from 11 to 20, eighteen; from 21 to 30, 147; from 31 to 40, eighty; from 41 to 50, thirty-three, and from 51 to 60, seven.

In recording histories an effort was made to learn whether there were any contributing causes that really had a bearing on the development of the disease. It was found that actual contact with some member of the family who had had tuberculosis was a factor in thirty-nine cases; that infectious diseases, such as influenza and measles, were a factor in thirty-one cases, and that trauma, caused by a severe fall, a heavy blow or heavy lifting, was probably a factor in fifty-nine cases. In the other cases nothing definite could be assigned as a contributing factor. The average duration of symptoms was three years. Tuberculosis was present elsewhere in the body in 101 cases; in sixty-five, roentgenograms and physical signs afforded evidence of involvement of the lungs. In some of these cases examination of the sputum was positive, but the patients were not operated on until the lesion in the lung was either healed or quiescent, and examination of the sputum was negative. In thirty-six cases tuberculosis was present elsewhere, chiefly in the genito-urinary tract. In these cases preference was given to surgical procedures on the urinary tract, the spinal fusion being performed later.

Tuberculosis in the joints other than the spine was negligible, being much less common than I had expected. The lesion was in the cervical region in one case, in the dorsal region in 121 cases, in the dorsolumbar region in forty-five, and in the lumbar region in 134. Eleven patients with more or less complete paraplegia were operated on. One obtained an excellent result; three obtained good results, three fair results, and one poor results; one died; two were not traced. In several cases, following the Hibbs procedure, the paralysis cleared up with astonishing rapidity. In one case, to my surprise, a patient with complete paraplegia operated on in the afternoon was almost entirely relieved by the next morning. A few years later, however, there was complete relapse to permanent paraplegia, and death resulted. Signs of cord pressure and irritation were present in a few other cases. Owing to the wide area over which the patients were scattered, it was impossible to examine all, but definite information was obtained concerning 264 by examination or by communication with the patient or his physician, from questionnaires or from letters. Less than two and a half years had not elapsed since the operation in any case. Thirty-seven (12.3 per cent) of the patients were not traced. The accompanying tabulation summarizes the results.

The results in 137 cases (51.8 per cent) were classified as "excellent" or "good." I was somewhat surprised to find that 20.4 per cent of the patients operated on were dead, thus showing that even in this more or less selected group the mortality rate was high. Practically all patients died from dissemination of the disease by way of the lungs, meninges or genito-urinary tract. The operative mortality was low; there were only three deaths (1 per cent). One death was due to pulmonary embolism three weeks after operation, one was due to shock (a young child), and one to meningitis about five weeks after operation. All the other patients left the hospital; any death occurring in the hospital, no matter how long after the operation, was considered an operative death.

COMMENT

In a study of the histories and the follow-up record of the patients it was noted that the length of time usually necessary to complete the convalescence in the cases in which the result was satisfactory was nearer two years than one, often extending to three years, and that patients who were able to take good care of themselves, who were getting plenty of rest, open air, and so forth, improved much faster. Because of economic conditions, many adults with families to support are denied the long period of recumbency that is so necessary in these cases. I am convinced that it is useless to subject patients with advanced tuberculosis of the lungs or of the genito-urinary tract to this operation. As I have stated, the operation does not eradicate the disease; it merely provides a permanent splint. The period of convalescence in such cases should be prolonged, and although in some cases ankylosis of the diseased vertebrae might finally occur, life expectancy is so short, because of tuberculosis elsewhere, that the benefit is negligible. In my

experience, the operation has not been satisfactory in children, but the number of children subjected to operation in this series was so small that particular emphasis should not be placed on this point. The operative results were better in cases in which the lumbar region was affected than if the lesions were elsewhere, and the results when the dorsolumbar region was affected were better than if the dorsal region was affected. In Hibbs' series of children, results were more favorable when the dorsal region was affected. The mortality rate in tuberculosis of the spine over a

Summary of Results in Traced Cases

	Excellent	Good	Fair	Poor	Fatal	Total
Cases	89.0	48.0	41.0	32.0	54.0	264.0
Per cent.....	33.7	18.1	15.5	12.1	20.4	99.8

period of years is high: 20.4 per cent in my series. In view of this, any procedure that will cause fusion and thus check the disease process, as is accomplished by a spinal fusion operation, is well worth while. Restoration to normal or to full duties of 33.7 per cent of the patients and almost to normal of 18.1 per cent (that is, highly satisfactory results in 51.8 per cent) definitely establishes the procedure as beneficial. Definite improvement was noted in 69.3 per cent. The remainder were failures; either the results were poor or the patients are dead.

CONCLUSION

Operative fusion has definite value in cases of tuberculosis of the spine. If an adult patient is in good general condition, and if there is no evidence of impending wide dissemination of the disease or draining sinuses that are likely to cause contamination of the operative field, an operation which will cause fusion of the diseased area is justifiable.

ABSTRACT OF DISCUSSION

DR. NATHANIEL ALLISON, Boston: About twenty years ago Dr. Bradford read a paper in which he said that by the use of the Bradford frame and recumbency and a certain amount of fresh air and good food, the death rate in tuberculosis of the spine had been reduced from 75 per cent to 50 per cent. Dr. Henderson's figures indicate that the death rate since operative intervention has been reduced from 50 per cent to 20 per cent. Our figures at the Massachusetts General Hospital in a series of cases which we have been able to follow for a number of years correspond definitely with Dr. Henderson's. We have had 73 per cent success in fusion. We have had 50 per cent success with adults in getting the patient well and back to his original job, or a similar job making the same wages as he made before, and our death rate was 24 per cent in this series. Dr. Henderson's death rate was 20.1 per cent in his series. I presume that if we all compiled our figures we would come out about where Dr. Henderson has. Our own statistical study of this situation corresponds almost exactly to his. We have had 12 per cent of patients who have shown improvement but were not able to go back to the same work they did before, or similar work, and make the same wage. We have had about 6 per cent of failures after operative intervention; that is, the fusion failed and called for reoperation, or the patient did not recover after the first operation and was included in our total death rate from tuberculosis of the spine of 24 per cent.

DR. H. B. THOMAS, Chicago: We have treated a considerable number of tuberculous backs conservatively and surgically, both in adults and in children. Dr. Henderson asks whether the operative treatment is worth while. He himself has answered this question in regard to adults. In children we have operated with little fear, probably with not enough. But in looking over our records we find very gratifying results in children, which do not incline us to reverse our treatment if we have it to do over again. Among these were three patients operated on before the age of 11 who were found to be in perfect health, caddying, with heavy golf bags and themselves playing golf. Six women, operated on under the age of 13, were found to be married and taking care of their families; one had six children. If urged for an opinion as to whether this operation should be done on children, we would be inclined to say "yes," provided a careful selection of cases is done, the operation is cautiously and gently performed, the anesthetic is properly chosen and given, and the after-care is what it should be. The type of operation might be mentioned first, in order to emphasize that frequently a periosteal compacted graft, either with the transplant or with fusion, has, in the hands of some, been satisfactory, and, secondly, to call attention to the use of the rib as a transplant which is, on account of its location, easily reached. Because of our inability to use the motor saw for removal of the tibia in the presence of certain anesthetics, particularly and probably only ethylene anesthetics, we are glad to be able to take the rib instead of the graft from the tibia. On account of death from anesthesia in two cases, a word regarding the kind of anesthesia and caution in its administration should not be out of place. Early in my practice at one of the large hospitals I had two deaths in children on the operating table, and I think it was entirely on account of the way the anesthetic had been given. It was given in a large hospital by an intern who was more interested in the operative field than in the administration of the anesthetic. Operations in adults can, of course be done easily under local anesthesia. Spinal and rectal anesthesias deserve consideration and probably should be used more in this type of work.

PARANEPHRITIC ABSCESS IN CHILDHOOD

REPORT OF CASES *

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Medical literature during the past fifteen years has contained very few reports of paranephritic abscess in childhood, and, as Helmholtz states, "it would seem that the condition is not as common as it was twenty to thirty years ago."

Since Rayer, in 1839, first described inflammation of the fatty capsule of the kidney as perinephritis, the terminology of inflammations in this neighborhood has been the object of many attempts to differentiate accurately one from the other. On a strict anatomic basis Israel has used the prefixes epi, para and peri to elucidate the pathologic conditions met, but clinically they are impossible of differentiation. Paranephritis means an inflammation of the fatty capsule and the pararenal accumulation of adipose tissue. Perinephritis is an inflammation of the fibrous capsule. Paranephritis is, however, quite generally understood to mean phlegmonous inflammation about the kidney, the final stage of which is a paranephritic abscess. It seems useless to me to quibble on this terminology, and the terms paranephritic or perinephritic abscess are to be considered identical at least from the clinical point of view.

REPORT OF CASES

CASE 1.—A girl, aged 32 months, was admitted to the private service of Dr. I. A. Abt at the Sarah Morris Hospital, with the diagnosis of pyelitis.

There was nothing in the personal or family history of significance except the history of pyelitis for several months.

* From the Department of Urology, Michael Reese Hospital.
* Read before the Section on Urology at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 13, 1928.

There was no history of tuberculosis in the family. The mother noted that the child was walking peculiarly, holding one shoulder higher than the other. She was in an excellent state of nutrition but had a two plus Pirquet reaction. After a fall from her wheel-chair, while in the hospital under the care of her mother, she had an attack of vomiting and her temperature rose to 103 F. I saw her about two and one-half days later and the left side of the abdomen was very tender to palpation and offered marked muscle defense. Her temperature during this interval had reached a maximum of 106, taken rectally. A mass was palpable in the loin which was continuous with the left kidney. The white count was 19,000 and *Bacillus coli* was present in the urine. Because of the acuity of the symptoms, following the fall from the wheel-chair, an operation was decided on that evening. At operation about 2 ounces (60 cc.) of thick, foul smelling, yellowish pus was evacuated. There was no exploration made of the kidney, so the presence of a cortical abscess was not determined. Drainage with small rubber tubes and gauze was instituted and the child left the hospital recovered in three weeks.

CASE 2.—A girl, aged 12 years, admitted to Dr. Kolischer's service, was large for her age and was sent to the female surgical ward. Her personal and family history afforded nothing pertinent to the condition for which she entered the hospital, except for a fall some three or four weeks before. This injury was sustained in play, when she fell while sliding down a cellar door. In the fall she struck herself against the narrow edge of an open door, the injury being to her right loin. She rather quickly recovered from the immediate effects of this injury and returned to school after a day or two. On entrance to the hospital she had a temperature of 102 F. and a white count of 23,000; the urine contained *Bacillus coli*, leukocytes and red blood corpuscles. On palpation in the right kidney area a tender mass was outlined which could also easily be felt anteriorly. Operation was decided on and an abscess was drained. Old blood clots were also found and removed, and a small tear in the convexity of the right kidney near the lower pole was seen. This tear was covered with fat, tied in place with two sutures and drainage instituted. The child remained in the hospital four weeks and was discharged as "improved." The term improved was used regardless of the good or apparently cured condition of the patient because there still remained the possibility of further pathologic conditions referable to the trauma.

COMMENT

The condition here undoubtedly was the result of trauma as the exciting factor, as well as the essential factor in the etiology of this abscess. The records of the children's department of Michael Reese Hospital reveal but six additional cases since 1913. I have had no contact with these cases but will briefly group the significant data.

Of the six patients, one was under 2 years of age, two were under 3 years, one was under 5, one under 10 and one under 12.

Five were boys and one was a girl.

One had just recently recovered from pneumonia. Two had had otitis media, one seven weeks before, the other twenty months previously.

One showed no significant etiologic factor in the anamnesis.

One had a history of tuberculosis in one of the parents. One had a history of purulent skin lesions some time before.

The symptoms noted were chiefly loss in weight, anorexia, pain on the affected side, chills, fever, sweats, sleeplessness and pain in the hip on flexion of the leg.

Two cases did not present any evidence of tumor mass, and rigidity was absent.

The urinary observations were positive in all cases, showing either pus, bacteria or red blood corpuscles. The etiologic bacteria were *B. coli* in three cases, *Staphylococcus aureus* in one and nonhemolytic streptococcus in one, while in the child that died both streptococci and staphylococci were found.

The white count was elevated in all cases, varying from a minimum of 18,000 to 38,000 per cubic millimeter.

The maximum temperature recorded was 106.2, taken rectally, and the peak in the case showing the least febrile reaction was 103.4.

Five patients recovered and one died after eighty days in the hospital.

FREQUENCY OF THE CONDITION

A discussion of the subject of paranephritic abscess necessitates certain mention of the condition in adults, but the references as they occur should be easily differentiated from those concerning the condition in children.

The largest clinics see about ten cases a year at all ages. I have not found any reference in their reports to its occurrence in childhood.

In children the sexes are reported as about equally affected, in adult life men twice as often as women.

The youngest reported case is by Gibney, occurring in a child 5 weeks old.

Fenwick reported four cases under the age of 10 years and nine cases between 10 and 20 years of age. Küster collected reports of twenty-four cases under the age of 10 years and seventeen between 10 and 20 years. Israel reported one case in a child, aged 12 years. Townsend reported six cases under the age of 14, all of which had been faultily diagnosed. Gibney reported five cases under the age of 3 years, twelve between 3 and 6 years, eight between 6 and 10 years, and three between 10 and 15 years.

ETIOLOGY

Etiologically, the subject has been the source of a diversity of opinion. Paranephritic abscess may be divided into four groups, some cases having a renal and others an extrarenal source or origin.

The primary metastatic type is due to the entrance of bacteria into the vessels of the fatty capsule, carried there by the lymph or blood vessels, without primary lesion of the kidney. The Mayo statistics do not show any case of this type.

The second metastatic group is due to the breaking through of a cortical abscess of the kidney parenchyma and is the most common variety.

The third variety is due to infection brought from a nearer or more remote organ. First in frequency is the kidney when affected by stone pyelonephrosis, pyelonephritis or traumatic rupture, more remotely from lesions of the lungs, the pelvic or abdominal organs, especially in cases of appendical or diaphragmatic abscess or empyema.

The fourth type is caused by direct invasion of bacteria from open wounds.

In 1909, Miller found evidence of primary renal disease in 11 per cent of cases, Braasch, in 1915, reported 56.4 per cent due to primary renal disease, and Richardson reported 30 per cent. At the Mayo Clinic among paranephritic abscesses among all ages only 4.7 per cent were due to traumatic rupture of the kidney.

Bacteriologic examination in cases of paranephritic abscess may demonstrate any one or more of the common pus-producing organisms, as well as *B. typhosus*, the gonococcus, *B. proteus-vulgaris* and various anaerobes.

Other diseases of wide variety, as those listed on the next page, often precede the onset of paranephritic abscess; especially does this refer to older patients.

A. Local peripheral purulent processes, which account for slightly more than half the cases, producing cortical abscess of the kidney: (1) furuncle; (2) carbuncle; (3) panaritium (?); (4) other phlegmonous processes.

B. Acute inflammatory diseases: measles, scarlet fever, smallpox, diphtheria, influenza, typhoid, sore throat, otitis media.

C. Direct and indirect traumas, which may cause injury to the renal parenchyma or fatty capsule or both: lifting heavy loads; sprain; fall; blow; contusion; wounds; constipation.

Gibney, in a report of twenty-eight cases in childhood, found nineteen cases in which no exciting cause was determined, eight cases after contusion, strain or fall, and one case after primary kidney disease.

PATHOLOGY

The pathologic condition varies somewhat according to the underlying cause. The right side is more frequently affected than the left. Most often the abscess occurs between the kidney and the lumbar muscles, next in frequency contiguous to either pole and rarely in the poorly developed portion of the fatty capsule anteriorly. The entire capsule is very seldom involved. Multiple abscess occurs frequently in the fatty capsules, each of which is surrounded by a hard zone of infiltrated tissue. Abscess of the fatty capsule characteristically tends to involve contiguous tissues. The direction of this involvement depends on the location of the abscess. Most frequently the retrorenal mass of adipose tissue is involved, when the infection may spread posteriorly, above or below.

Küster states that the infection spreads along the blood vessels, nerves and lymphatics. In an upward direction the infection may reach the diaphragm and then involve the pleural cavity by one of several methods. Pleural irritation may occur from toxins within the abscess, producing a dry or serous pleuritis. The serous pleuritis may become purulent and become an empyema, which may also occur without any previous serous stage, when bacteria have wandered through the diaphragm and its pleural covering. Lesions of the pelvic organs occur in a similar manner.

Abscesses of the lower pole of the fatty capsule spread into the tissues of the iliac fossa, from which they spread along the iliopsoas into the pelvis, whence the pus may travel under Poupart's ligament to the surface or may eventually point along the surface of the thigh. Or it may travel along the ureter or the spermatic vessels and rupture into the ascending colon, the sigmoid or the ureter, bladder or vagina. Of thirty-four cases of perforation reported, eighteen were into the pleura and bronchi. The kidney is never wholly spared in paranephritic abscess. Thrombosis of the renal veins, necrosis of the kidney, or atrophy due to cicatricial contraction of the fatty capsule may occur.

Cortical abscess is undoubtedly the most frequent cause of paranephritic abscess, and the diagnosis of cortical abscesses should always be thought of in this connection. Of nearly two thousand nephrectomies reported, about 10 per cent were done for cortical abscess.

At the clinic in Breslau, the interval between the time of the etiologic insult (when determined) to the diagnosis of paranephritic abscess averaged three and one-half weeks.

Bilateral paranephritic abscess is very uncommon but does occur. Twelve cases in all appear in the literature, six of which were reported by Harzberger and one each by six different authors.

SYMPTOMS

The symptoms are variable. There is no definite solely characteristic symptom-complex in this condition. The diagnosis cannot be laid down by rule of thumb. The group due to extrarenal pathologic conditions may often present very vague symptoms and those difficult of interpretation, so that great injury to the kidney may supervene as well as general sepsis before a diagnosis has been established.

In children the onset is usually with severe pain in the kidney region near the vertebrae, though it may be referred to the terminal filaments of the nerves and be felt in the axillary line or in the front of the body. The pain may be intermittent in type and simulate lumbago, or extend downward and be mistaken for sciatic pain. The pain is occasionally felt in the distribution of the obturator and crural nerves. If constant, it may be severe or dull. The spine is usually held rigid.

Objectively, there is tenderness on pressure over the affected side. The thigh is held in flexion and attempts to straighten it out cause pain. Contraction of the psoas causes lameness and tilting of the pelvis, with consequent bending of the body to the affected side, thus accounting for the frequent error of diagnosing the case as one of early hip disease.

Abscess of hematogenous origin may present very acute symptoms with intensely severe general and local symptoms. Pain and fever are practically always present, though the character of the fever is not at all characteristic. The onset is often associated with a chill. Flexion of the leg on the affected side is present also in about 50 per cent of adult cases. Edema at the outer border of the sacrolumbalis muscle is common. The skin is often reddened and may be infiltrated. Muscle defense is usually marked on the affected side.

DIAGNOSIS

The diagnosis of paranephritic abscess is not possible until there are definite local indications, because the general symptom complex, as stated, is not characteristic. A careful history that includes minute details of previous illnesses is very helpful in elucidating the conditions found at the time of examination. Especially the history of furunculosis, carbuncle and other less important purulent processes often lead one to a correct interpretation of the physical observations. The determination of previous lesions of the kidney, such as pyelonephrosis, pyelonephritis and stone, is significant in helping to establish the diagnosis. The onset of spontaneous pain in the lumbar region or loin accompanied by chills, fever, vomiting and tenderness over the renal region is indicative, and whether a palpable tumor mass can be made out or not should lead the surgeon to suspect the likelihood of abscess in this region. An early symptom, according to Belikoff, is tenderness at the entrance of the long lumbar nerves through the skin. These nerves run between the quadratus lumborum muscle and the kidney capsule and are therefore easily affected. This symptom is absent in other retroperitoneal pus accumulations, as in retrocecal appendicitis. The faulty diagnosis of neuritis is explained by the early involvement of these nerves.

The examination of the urine is of course a routine procedure, but the observations may be very much less than the pathologic process would be expected to produce. The examination of a twenty-four hour specimen is valuable and may show occasional red blood cells, hyaline casts and a variable number of leukocytes, as well as albumin in varying amounts. The conditions

found in the urinary sediment may be, however, entirely negative or may show bacteria with practical absence of leukocytes.

The roentgenologic observations are often significant in showing a markedly enlarged and indistinct kidney shadow on the affected side, and an indistinct outline of the psoas muscle or none at all. Occasionally very striking abnormalities in the pyelogram as a result of extrinsic pressure are seen. When a paranephritic abscess supervenes on a long standing renal lesion diagnostic errors may occur, but the condition should be diagnosed by the proper use of routine diagnostic methods.

The differential diagnosis of paranephritic abscess includes typhoid, pleurisy, pneumonia, septicemia, septic nephritis, grip, tuberculosis, hip disease, sciatica and tuberculosis of the spine.

PROGNOSIS

In primary metastatic cases the prognosis is good with early evacuation, but when due to pathologic conditions within the kidney the prognosis depends on the renal lesion and is less favorable.

Gibney reports no deaths from this condition in twenty-eight cases occurring in children. Shede reports no deaths in twenty cases of the metastatic group. Richardson reports 10 per cent mortality in fifty-nine cases of all kinds, and Miller reports 40 per cent mortality when due to a kidney lesion and 20 per cent when due to other causes.

TREATMENT

In every case of paranephritic abscess operative treatment should be given as soon as diagnosed, but this opinion does not seem to be shared by many pediatricians and some others. One should not wait for fluctuation to develop, but, on the definite probability of the correctness of the diagnosis, operative intervention is warranted. The operation for mere drainage is simply and quickly done and offers practically no technical difficulties and no danger to life, while delay in operating or waiting for spontaneous rupture carries with it a long trend of highly dangerous pathologic changes which may cost the patient his life, such as septicemia, pyemia and toxic nephritis.

The kidney region should be exposed in the usual manner, plenty of room being allowed for thorough examination of the parts. When the abscess is located and the purulent content is evacuated, it is well, if possible, to explore carefully the contour and relations of the abscess so that multiple abscesses or connecting ones can be thoroughly drained. Ordinarily the operator is satisfied to have located the site of the abscess and assured himself that free exit to the products of inflammation has been afforded. This is justifiable in some cases and the judgment of the operator is called on to determine how far he dare proceed in his examination of the kidney. Whether a primary nephrectomy is indicated in a given case is a question that can be answered only when all the facts of that particular case at the time of operation are known. Often the simple drainage of an abscess with no attempt at a wide freeing of the fatty capsule from the entire surface of the kidney is the wiser plan. Delaying nephrectomy until the operative field can be made comparatively clean seems also to be a better procedure than to attempt this operation in a highly contaminated and infiltrated field on a patient whose general condition is none too good. Obviously, no definite rules can be laid down for the surgical management of all cases.

CONCLUSIONS

1. Paranephritic abscess occurs infrequently in children.

2. Trauma has an important rôle in its occurrence, as well as previous diseases, especially the acute infectious diseases and those accompanied by purulent processes.

3. There is no definite symptom complex diagnostic for paranephritic abscess.

4. The interpretation of local conditions, the careful attention to history of previous diseases and routine urologic diagnostic methods should lead to a comparatively early diagnosis.

5. Early operation is indicated as soon as diagnosis is established.

25 East Washington Street.

ABSTRACT OF DISCUSSION

DR. H. C. HABEIN, Rochester, Minn.: The early diagnosis of perinephritic abscesses is extremely important in order that such serious complications as generalized sepsis, destruction of the kidney and lung abscesses may be prevented. In a recent review of forty-three cases of the metastatic type of perinephritic abscesses seen at the Mayo Clinic, I found that the length of time between the onset of symptoms and surgical intervention varied between one and forty weeks, an average of 5.6 weeks. This would indicate that the disease is not recognized early. When perinephritic abscess is secondary to such diseases of the kidney as pyonephrosis, lithiasis, tuberculosis and traumatic rupture, the diagnosis is not extremely difficult. In this group of cases our attention is focused on the renal area, and with the aid of roentgenologic data, urinary studies and cystoscopic examination, the condition is not so likely to be overlooked. It is in the metastatic type of abscess that our greatest diagnostic difficulty lies. I agree with Dr. Eisenstaedt that this type of perinephritic abscess is usually secondary to a cortical abscess. Probably the most common causes of such cortical abscesses are superficial infections, such as boils, carbuncles, paronychia and tonsillitis. At times such infections are obvious, at other times infections may have been so slight that the patient has entirely forgotten them. Then, too, bacteria may have entered the circulation through unnoticed abrasions or cracks in the fingers and toes. Patients have been observed in whom a history of carbuncles antedated the onset of symptoms of perinephritic abscesses as long as from four to six months. It is obvious that a careful history in regard to superficial infections is important in the diagnosis of perinephritic abscesses. Pain over the site of the abscess is a rule, but it is important to remember that tenderness on palpation is not always present. This is especially true if the abscess is situated at the upper pole of the kidney. Dr. Eisenstaedt has suggested a similarity of symptoms in perinephritic abscesses and early hip and spine disease. This is especially true in children. In the early stage of perinephritic abscesses there is a moderate fever combined with loss of weight and appetite and pain on motion of the hip and spine. Tuberculosis is often suspected. Careful physical examination combined with roentgenologic studies, a history of injury or of superficial infections and a rapid course of the disease should aid in the diagnosis. Cystoscopic examination is indicated in cases in which the diagnosis is in doubt in order to rule out primary renal diseases. A distorted pyelogram as a result of pressure over an abscess may often aid in the diagnosis. Carty, and more recently Lipsett and Beer, have called attention to the curvature of the spine with the convexity away from the abscess as a valuable diagnostic aid.

DR. B. A. THOMAS, Philadelphia: Concerning the etiology of perinephritic abscess, it might be of interest to cite a case that I saw three or four years ago. The patient, a young woman, had received an insect bite on the foot during the summer. As the result of scratching, infection and ulceration

developed and persisted for several weeks. This finally healed, but four or five months later a perinephritic abscess developed. A large quantity of pus was evacuated surgically, from which *Staphylococcus aureus* was isolated. The kidney, both before and at the time of operation, was intact and apparently did not have any connection with the suppuration. The patient was free of any focal infection that might be held responsible as a cause for the formation of the abscess, other than the infection of the foot several months previously, remote as this may at first thought appear.

DR. LOUIS CLIVE JACOBS, San Francisco: Four cardinal signs point to the diagnosis of perinephritic abscess: first, the roentgenographic observations; second, the temperature; third, tenderness over the costal margin, and fourth, the leukocyte count. I believe that a tentative diagnosis can be made by the process of elimination and a study of the roentgenogram. This usually shows an obliteration of the psoas muscle, which, in the presence of a septic temperature, associated with tenderness over the costal margin, would be indicative of a perinephritic abscess. I am convinced that with such observations we should not hesitate to operate immediately for the evacuation of pus. In reference to the etiology, I have had several patients with the identical causative factors that have been enumerated. Besides, I have seen one case of tuberculous origin. Both the cystoscopic examination and the catheterized specimens of urine were negative for any pathologic condition. Likewise, the guinea-pig inoculation was negative for tuberculosis. The functional tests were excellent. At operation, considerable pus was evacuated. Two weeks later, there was another rise in temperature, and on reoperation a portion of the upper pole of the kidney came away. This portion of the kidney substance was sent to the pathologist, who reported tuberculosis.

DR. ROBERT E. CUMMING, Detroit: Since Dr. Eisenstaedt discussed the etiology of perinephritic abscess, I wish to put on record an interesting case. A woman, aged 35, had been under the care of an orthopedic surgeon for treatment of tuberculosis of the spine, which did not exist, as we found on opening a perinephritic abscess. The appearance of the pus was suggestive, and we requested an examination for *Actinomyces,* but the discharge showed staphylococci only. Then we examined for tubercle bacilli, and finally found them in the urine. Six months later we removed the kidney, after a series of blood transfusions, and found it completely destroyed by actinomycosis. There was no evidence of that disease in any other portion of the patient's body. While the common causes of perinephritic abscess are known to us, we must bear in mind tuberculosis and such rare conditions as actinomycosis.

DR. A. I. FOLSOM, Dallas, Texas: I saw a patient, aged 16, who gave no evidence of urethral infection but developed an acute prostatic abscess. It evidently was metastatic from some boils he had had sixty days before. We did a perineal section and evacuated a considerable amount of pus. He recovered and went home in apparently good condition. In less than sixty days he returned with a perinephritic abscess, which I think came directly from the prostatic abscess. Another thing which has been brought vividly home to me is the fact that not all perinephritic abscesses tend to point or come to the surface posteriorly. Sometimes they are remarkably superficial in front. They seem to be almost under the anterior abdominal wall. I recall one case that Dr. Smoot and I studied for several days, which he thought was intra-abdominal because the abscess felt so close to the interior abdominal wall and the posterior group of muscles was relaxed. Only after a roentgenogram and functional tests were made could I persuade him to permit operation. A large perinephritic abscess was found. I have seen another case since then, and these confuse us in differentiating them from intra-abdominal lesions.

DR. JOSEPH S. EISENSTAEDT, Chicago: The only point I wish to stress particularly is the statement that these lesions should be opened as rapidly as possible, because, although they may tend to resolve themselves, they compromise the kidney by contraction of the capsule, and in later years it may be necessary to do a nephrolysis because of decreased function of the kidney. I am firmly convinced of the desirability of opening these abscesses as soon as a definite diagnosis is made.

DIABETES MELLITUS IN TWINS

ALLEN H. BUNCE, M.D.
AND
MARK S. DOUGHERTY, M.D.
ATLANTA, GA.

Disease in twins offers an interesting and intriguing study. Two similar individuals who start life at the same time under the same conditions of inheritance and environment afford a great opportunity for the observation of the development of hereditary characteristics and the influence of environment and intercurrent infections. There was one pair of twins in every ninety-seven births in the United States in 1917 as recorded in 1,339,975 births.[1] Of this number from 12 to 25 per cent were identical or uniovular twins. These were twins that resulted from the fertilization of a single ovum by a single spermatozoon and "involved some process of fission, or division of a germ which is at first a single individual into two or more individuals."[2] Uniovular twins are enclosed in the same fetal membranes and are usually nourished from the same placenta. They are always of the same sex and are usually identical in appearance, having skin of the same texture and hair and eyes of the same color. They are also similar in the finer details of anatomic structure and metabolism as well as in character. There are many interesting citations of the simultaneous onset of the same malady in these individuals.

We have collected reports of five cases of diabetes mellitus in twins thus far published. In a personal communication, Dr. Elliott Joslin states that he has data on eight cases which will be reported in the near future.

In 1904 Michaelis[3] described male twins who resembled each other in body, behavior and even handwriting. One, a bachelor, was at the head of a big business; the other, married, and the father of several children, managed a large farm. At 60 years of age the two brothers were affected simultaneously with ulcer perforans of the great toe, paresthesias, great psychic irritability, diabetes and accompanying signs of albuminuric retinitis. Both, of their own accord, tried to correct the perversion of vision by the use of strong convex glasses. Both died in coma within a few weeks.

V. Müller related another case orally to Siemens[4] of male twins who were affected by diabetes at an advanced age and within a few years died of it. These twins suffered from similar cardiac disturbances as well.

In 1918 Strouse[5] reported diabetes mellitus in twin children, a boy and a girl, aged 11 years. The girl was carried to the hospital with the complaints of irritation of the vulva and increased thirst. When examined the urine was found to contain sugar. A short time later her twin brother was examined and his urine was found to contain sugar. There was nothing of significance in the past history of these children. The family history was negative except for the presence of tuberculosis on the mother's side of the family.

In 1925 Murray[6] reported the case of twin sisters with diabetes. One sister came to him because of an

1. Abt, I. A.: J. Iowa M. Soc. **14**: 395 (Sept.) 1924.
2. Newman, H. H.: The Biology of Twins, University of Chicago.
3. Michaelis, Rudolf: Die erbliche Beanlagung bei der menschlichen Tuberculose nach eigenen Beobachtungen, Arch. f. Rassen u. Gesell. Biol. **1**: 198-209, 1904.
4. Siemens, H. W.: Die Zwillingspathologie: ihre Bedeutung, ihre Methodik, ihre bisherigen Ergebnisse, Berlin, Julius Springer, 1924, p. 71.
5. Strouse, S.: Juvenile Diabetes in Twins, M. Clin. North America **1**: 1241-1259 (March) 1918.
6. Murray, G. R.: A Study of Twins in Health and Disease, Lancet **1**: 529-532 (March 14) 1925.

increase in the output of urine. She stated that her twin sister had developed diabetes about one year previously. The disease had run a rapid course and her sister had died in coma at the end of nine months. The disease in her case ran the same course and she died in coma at the end of nine months.

In 1925 Kückens [7] reported the occurrence of diabetes mellitus in similar twin boys, 15 years of age. These twins were extraordinarily alike, being of the same height, and having eyes and hair of the same color and skin of the same texture. Their school records were exact duplicates. One twin developed severe diabetes at 15 and died in diabetic coma twelve weeks after the onset of the disease. Shortly before he died, sugar appeared in the urine of his brother, who was placed on a diabetic diet with insulin and was still living at the time the cases were reported.

The following cases are thought worthy of report, first, because of the unusual occurrence of diabetes mellitus in twins; secondly, because both cases manifested themselves within a few months of each other and not until the patients were 27 years of age, and, thirdly, because the patients presented certain congenital anomalies in common.

REPORT OF CASES

CASE 1.—J. C. S., a white man, aged 27, single, was admitted to the hospital, May 31, 1927, in a state of chronic acidosis with impending coma. He was greatly emaciated, and weakness was so marked that he collapsed in front of the hospital to which he had been taken by a stranger, who had picked him up on the road to Atlanta after he had left the mountainous region of Georgia on foot in order to seek relief. He subsequently had no recollection of his arduous journey to the hospital. His breathing was labored and the skin was dry, wrinkled and covered with scratches as a result of the extreme pruritus. A voided specimen of urine showed 1.5 per cent sugar and a large amount of acetone and diacetic acid. A specimen of blood showed 500 mg. of sugar per hundred cubic centimeters. Within the first eight hours after the administration of a total of 120 units of insulin, together with orange juice and water at frequent intervals, his breathing became normal, the urine was sugar free, and the blood sugar was reduced to 200 mg. per hundred cubic centimeters. The patient's subsequent recovery on a weighed and measured diet with sufficient insulin to keep the urine sugar free and the blood sugar within normal limits was very slow on account of the extreme undernutrition.

He was a farmer by occupation and a "moonshiner" as well. His present illness began four months previous to his admission to the hospital while he was serving a term on the state farm for violation of the prohibition law. He was paroled so that he might return to his home in the mountains because he was thought to have tuberculosis. He had lost 25 pounds (11 Kg.) up to the time of his admission to the hospital.

The patient's height was 5 feet 10 inches (178 cm.) and his weight was 97 pounds (44 Kg.) at the time of examination. He had a convergent strabismus of the left eye with a very high degree of amblyopia of the same eye. Both eyes showed a marked horizontal congenital nystagmus, which was constantly present. There was a hyperphoria of the left eye. There was also a partial bilateral deafness of the conductive type. He presented symptoms of extreme nervousness probably based on a neuropathic constitution in addition to anxiety over masturbation and nocturnal emissions.

The previous history was negative except for a mild attack of influenza in 1918 and a severe attack in 1922.

The patient's father was living and well. (An examination of his urine was negative for sugar.) His mother died of hemorrhage from the lungs at 39 years of age. Two children had been born to his mother prior to the birth of himself and his twin brother. An aunt had had twin daughters.

On dismissal from the hospital at the end of eight weeks, the patient weighed 110 pounds (50 Kg.) and was taking a diet of carbohydrates, 65 Gm., proteins, 85 Gm., and fats, 165 Gm., with 20 units of insulin daily. On this regimen the urine was sugar free and the blood sugar was within normal limits. During the interval since his hospital treatment, the patient has not followed the diet strictly and has consequently had sugar in the urine frequently. At present he is adhering to his regular treatment and is able to do manual labor on a farm.

CASE 2.—H. C. S., a white man, aged 27, single, the twin brother of patient 1, came for examination, Aug. 8, 1927, because of nervousness, indigestion and loss of weight. He was 5 feet 10 inches (178 cm.) tall and weighed 114 pounds (52 Kg.). The right eye showed a divergent strabismus, with marked impairment of vision. There was also a hyperphoria of the right eye. A marked horizontal congenital nystagmus of both eyes was constantly present. There was partial bilateral deafness of the conductive type. He was of a nervous temperament, had premature ejaculations and nocturnal emissions, and practiced masturbation.

The urine showed a specific gravity of from 1.026 to 1.030 and was sugar free. The fasting blood sugar was 150 mg. per hundred cubic centimeters.

The previous history was negative except for an attack of influenza in 1918 and an attack of "indigestion" accompanied by polyuria and a loss of 21 pounds (9.5 Kg.) in 1920, at which time he was operated on for "chronic appendicitis." In 1923 he passed several roundworms.

Following his first visit he returned home and shortly thereafter developed an abscess on the left forearm which was accompanied by chills, fever, nocturia and polyuria.

September 29, he returned for observation. The urine contained 3.3 per cent of sugar; the blood, 550 mg. per hundred cubic centimeters. He was placed in the hospital; on appropriate treatment the urine became sugar free; the blood sugar, normal. At the end of two weeks he was dismissed on a diet of carbohydrates, 65 Gm., proteins, 85 Gm., and fats, 165 Gm., with 20 units of insulin daily. He has followed the treatment outlined carefully, and in contrast to his brother has rarely shown sugar in the urine.

COMMENT

There seemed to be several things worthy of note in these cases: The disease developed in both patients within a period of four months in their twenty-seventh year; there was nothing in their past or family histories that seemed to have any particular bearing on their present conditions, and both patients presented certain congenital defects in common. One had a convergent strabismus with an amblyopia of the left eye, while the other had a divergent strabismus with an amblyopia of the right eye. This mirror effect of a congenital defect in identical twins is very rare and presents interesting possibilities of speculation. Both men had a horizontal nystagmus of both eyes and a rather high degree of hyperphoria, and both had a partial deafness of the conductive type. They responded to the same treatment and maintained a normal blood sugar on the same diet plus 20 units of insulin daily.

A review of all the cases of diabetes mellitus in twins thus far reported fails to reveal any extraneous etiologic factor. There is no one period in life in which the disease seems to occur more frequently than in any other. However, it usually develops in twins simultaneously and runs the same clinical course. The occurrence of a disease in identical twins would seem to indicate some inborn or hereditary constitutional factor, while the development of a disease in one twin and not in the other would seem to indicate some other etiologic factor. A similarity in two persons that is as marked as in these men and extends alike to appearance, character, metabolic disturbances and even to the finer details of similar congenital defects would seem to render them more liable to develop the same disease.

139 Forrest Avenue Northeast.

7. Kückens, H.: Hereditary and Familial Tendency to Paralysis Agitans and Diabetes Mellitus in Univitelline Twins, Klin. Wchnschr. 4: 2289-2291 (Nov. 26) 1925; abstr., J. A. M. A. 86: 236 (Jan. 16) 1926.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY OF THE AMERICAN MEDICAL ASSOCIATION HAS APPROVED THE FOLLOWING REPORT.

H. J. HOLMQUEST, Secretary.

KNY-SCHEERER INFRA-RED GENERATOR ACCEPTABLE

The infra-red ray lamp manufactured and submitted for consideration by the Kny-Scheerer Corporation, New York City, is, as its name indicates, a generator of radiant heat. The therapeutic indications for this device are essentially the therapeutic indications for heat.

The following report by the New York Testing Laboratories, 80 Washington Street, New York City, on the construction and electrical characteristics of the lamp was presented by the manufacturer:

The lamp consists of an 18 inch double shell aluminum reflector about 10 inches high, having four porcelain receptacles equally spaced and centered about 4½ inches above the wire screen at the bottom of the reflector. A spring frame carrying two "Globar" rods is attached to a porcelain screw plug which fits into the receptacles. The rods are in series.

The reflector is attached to an adjustable arm whose position can be varied on a 6 foot stand.

The rating on the name plate of the apparatus was as follows:

Volts..... 110 Amperes..... 8

ELECTRICAL TESTS

After twelve hours' continuous operation, voltage was 110 and current consumption 6.52 amperes.

The "Globar" elements vary from a black to a very dull red in operation, maximum temperature of the bars being about 900 F.

A curve was run to determine initial surge and time to come to full power consumption with the following results:

Time	Amperes	Volts
Initial	4.8	110
Seconds—		
5	4.0	110
15	4.6	109
30	5.3	108
45	5.2	108
Minutes—		
1	5.0	107
1½	6.1	107
2	6.2	107
3	6.3	107
4	6.35	107
5	6.35	107
30	6.35	107

A high voltage test consisting of application of 1,000 volts for one minute between lead wires and reflector was made with no breakdown.

HEATING TESTS

After twelve hours' continuous operation the following temperatures were noted:

	Temperature, F.
Reflector shell, outside bottom	187
Top of outer shell of reflector	178
Between inner and outer shell over "Globar" element	315
5 inches below center of screen—nonabsorptive body	214
5 inches below center of screen—absorptive body	247

These readings would indicate freedom from fire hazard with normal use of the instrument.

ELECTRICAL CONSTRUCTION

The conductor consisted of single twisted lead wires running sixty-five 10 mil strands each, rubber covered, asbestos cord over the rubber and cotton braided on the outside. The length was 10 feet and had a perkins push button switch rated, 10 amps., 125 volts, 5 amps., 250 volts, Underwriters' Lab. Inspected.

The wiring connecting the sockets back of the inner shell was asbestos covered number 14 B. & S. gage.

Mica plates between the four socket contacts and outer shell were noted.

SUMMARY

Our tests indicate proper electrical construction of the lamp and compliance with safety requirements.

The following report by Dr. H. Austin Taylor of New York University, on the emission characteristics of the lamp, was also submitted:

All tests were made on one of the four units in the lamp consisting of two resistance rods operated in series on 110 volts.

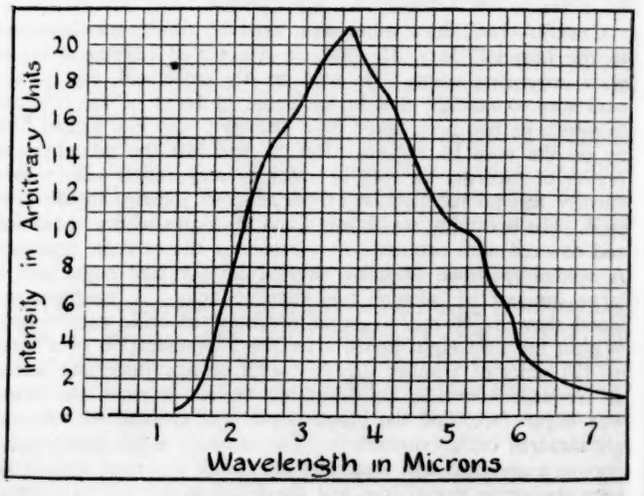
1. *Total Emission.*—The current carried by a unit at full heat is 1.85 amperes at 110 volts, being equivalent to 203.5 watts, or 49 calories per second. Hence the emission for four units will be 196 calories per second. Of this heat some will be lost by conduction in the metal holder of the unit in the early stages of heating, but eventually the holder having reached the temperature of the rods will also radiate heat and a stationary state will be set up whereby all the energy put in comes out as heat. The reflector, being of aluminum, has a coefficient of reflection of 90 per cent at the maximum wavelength found (see later). Hence the minimum amount of heat emitted will be approximately 180 calories per second from the whole lamp.

2. *Temperature.*—The temperature varies slightly with different rods, but measurement with an optical pyrometer gave an average value of 1,200 F., which is equivalent to 650 C. This will, of course, be the effective temperature of the lamp as a whole.

3. *Spectral Distribution.*—Fifty readings of the emissivity of the unit, carrying full load, were made, a Hilger infra-red spectrometer with Moll thermopile and galvanometer being used as measuring instruments. The range of wavelengths covered was 7,000-70,000 angstrom units (0.7-7 microns). Although the lamp has a dull red glow and is therefore emitting energy of wavelength 7,000 A., the intensity at this point is almost too feeble for measurement. The maximum emission occurs at 3.6 microns, or 36,000 angstrom units, a fact well explainable, since a "perfect" or so-called black-body radiator at this temperature would have a maximum emission at 3.2 microns, or 32,000 angstrom units, while the silicon in the carborundum has a selective emission maximum around 3.8 microns, or 38,000 angstrom units (see Coblentz, W. W.: Investigations on Infra-Red Spectra). These two effects couple to give the observed maximum at 3.6 microns.

The general trend of the curve is shown in the accompanying diagram and resembles closely the curve of a black-body radiator, showing that more than 50 per cent of the energy emitted lies between the limits 2.5 and 4.5 microns.

The foregoing report by Professor Taylor on the emission characteristics of the Kny-Scheerer infra-red generator is accepted by the Council with the following qualifying statement: The holder will not reach the temperature of the rods but will rise to a final constant state, at which temperature the energy radiated per unit time by the holder will equal the energy received per unit time from the rods. This temperature is obviously below that of the rods.



Spectral energy distribution curve.

The Council also points out that the total available output of radiant energy, 180 calories, must not be confused with the radiant flux density at some distance in front of the reflector.

The Council on Physical Therapy declares the Kny-Scheerer Infra-red Ray Lamp acceptable for inclusion in its list of accepted devices for physical therapy.

Heart Disease.—It behooves us to get clearly in our own minds what we mean by the general term "heart disease" and such other terms as we are prone to use. It seems to me advisable to limit the diagnosis of "heart disease" to such cases as present evidence from which we may fairly accurately infer that the heart muscle, through the effects of infection, strain, undernutrition or developmental disturbance, has been so managed that it accomplishes its task only at the expense or sacrifice of more or less of its reserve. The state of the heart muscle is such that the strain of undue exertion, the toxic effects of intercurrent infection or the progressive nutritional disturbances of aging sooner or later precipitate the signs of myocardial insufficiency: congestive failure, edema, or cardiac pain. —Herrmann, G. R.: Some Principles and Practices in Cardiology, *New Orleans M. & S. J.*, December, 1928.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, Secretary.

NORMAL HORSE SERUM (See New and Nonofficial Remedies, 1928, p. 348).

The National Drug Co., Philadelphia.

Normal Horse Serum.—Marketed in packages of one syringe containing 10 cc.; in packages of two syringes each containing 10 cc.; in packages of one vial containing 25 cc.; in packages of one double ended vial containing 50 cc.; also in packages of one double ended vial containing 100 cc.

DIPHTHERIA ANTITOXIN, CONCENTRATED (See New and Nonofficial Remedies, 1928, p. 352).

The National Drug Co., Philadelphia.

Diphtheria Antitoxin, Extra Concentrated.—Prepared by inoculating horses with diphtheria toxin. The product is concentrated by the Banzhaf method and preserved with 0.4 per cent cresol. Marketed in single vial packages of 1,000 and 20,000 units; in syringes containing, respectively, 1,000, 3,000, 5,000, 10,000 and 20,000 units.

TETANUS ANTITOXIN, CONCENTRATED (See New and Nonofficial Remedies, 1928, p. 356).

The National Drug Co., Philadelphia.

Tetanus Antitoxin.—Prepared by inoculating horses with tetanus toxin. The product is concentrated by the Banzhaf method and preserved with 0.4 per cent cresol. Marketed in packages of one vial containing 1,500 units; in packages of one syringe containing 1,500 units; also in packages of one syringe containing 5,000 units.

ANTISTREPTOCOCCUS SERUM (See New and Nonofficial Remedies, 1928, p. 361).

The National Drug Co., Philadelphia.

Antistreptococcic Serum.—A polyvalent serum obtained by immunizing horses with streptococci from various clinical sources. Marketed in packages of one syringe containing 20 cc. and in packages of one double-ended vial containing 50 cc. accompanied by apparatus for intravenous injection.

VACCINE VIRUS (See New and Nonofficial Remedies, 1928, p. 362).

The National Drug Co., Philadelphia.

Vaccine Virus.—Marketed in packages containing, respectively, one, five and ten capillary tubes.

ANTIRABIC VACCINE (See New and Nonofficial Remedies, 1928, p. 363).

The National Drug Co., Philadelphia.

Rabies Vaccine-Human (Semple Method).—An antirabic vaccine prepared according to the general method of David Semple (phenol killed). The brains and spinal cords of rabbits killed on the sixth or seventh day after inoculation with fixed virus rabies are ground with physiological solution of sodium chloride containing 1 per cent of phenol to yield an 8 per cent suspension of brain substance.

The mixture is incubated at 37 C. for twenty-four hours and then diluted with an equal volume of physiological solution of sodium chloride so that the finished product represents a 4 per cent emulsion marketed in sets of two packages, the first containing four 2 cc. vials and the second containing ten 2 cc. vials. All the doses are of the same potency; one dose is to be given daily over a period of fourteen days.

PERTUSSIS BACILLUS VACCINE (See New and Nonofficial Remedies, 1928, p. 376).

The National Drug Co., Philadelphia.

Pertussis Vaccine.—A suspension of killed *Bacillus pertussis* in physiological solution of sodium chloride, preserved with 0.4 per cent cresol. Marketed in packages of one 5 cc. vial containing 4,000 million killed pertussis bacilli per cubic centimeter; in packages of one 15 cc. vial containing 4,000 million killed pertussis bacilli per cubic centimeter; in packages of one 30 cc. vial containing 4,000 million killed pertussis bacilli per cubic centimeter.

PNEUMOCOCCUS VACCINE (See New and Nonofficial Remedies, 1928, p. 379).

The National Drug Co., Philadelphia.

Pneumococcus Vaccine.—A suspension of killed pneumococci Types I, II, III, IV in physiological solution of sodium chloride, preserved with 0.4 per cent cresol. Marketed in packages of one 5 cc. vial containing 5,000 million killed pneumococci per cubic centimeter; in packages of one 15 cc. vial containing 5,000 million killed pneumococci per cubic centimeter; in packages of one 30 cc. vial containing 5,000 million killed pneumococci per cubic centimeter.

STAPHYLOCOCCUS VACCINE (See New and Nonofficial Remedies, 1928, p. 381).

The National Drug Co., Philadelphia.

Staphylococcus Vaccine.—A suspension of killed *Staphylococcus albus* and killed *Staphylococcus aureus* in equal proportions, in physiological solution of sodium chloride, preserved with 0.4 per cent cresol. Marketed in packages of one 5 cc. vial containing 2,000 million killed bacilli per cubic centimeter; in packages of one 15 cc. vial containing 2,000 million killed bacilli per cubic centimeter; in packages of one 30 cc. vial containing 2,000 million killed bacilli per cubic centimeter.

TYPHOID VACCINE (See New and Nonofficial Remedies, 1928, p. 383).

The National Drug Co., Philadelphia.

Typhoid Vaccine.—A suspension of killed *Bacillus typhosus* in physiological solution of sodium chloride, preserved with 0.4 per cent cresol. Marketed in packages of one 5 cc. vial containing 1,500 million killed typhoid bacilli per cubic centimeter; in packages of one 15 cc. vial containing 1,500 million killed typhoid bacilli per cubic centimeter; in packages of one 30 cc. vial containing 1,500 million killed typhoid bacilli per cubic centimeter.

Typhoid-Paratyphoid Combined Vaccine.—A suspension of killed *Bacillus typhosus*, killed *Bacillus paratyphosus* A and killed *Bacillus paratyphosus* B in physiological solution of sodium chloride, preserved with 0.4 per cent cresol. Marketed in packages of three 1 cc. vials, the first dose containing 500 million killed typhoid bacilli, 375 million killed paratyphoid A bacilli and 375 million killed paratyphoid B bacilli, the second and third doses each containing 1,000 million killed typhoid bacilli, 750 million killed paratyphoid A bacilli and 750 million killed paratyphoid B bacilli; in packages of one 5 cc. vial containing 1,000 million killed typhoid bacilli, 750 million killed paratyphoid A bacilli and 750 million killed paratyphoid B bacilli per cubic centimeter; in packages of one 15 cc. vial containing 1,000 million killed typhoid bacilli, 750 million killed paratyphoid A bacilli and 750 million killed paratyphoid B bacilli per cubic centimeter; in packages of one 30 cc. vial containing 1,000 million killed typhoid bacilli, 750 million killed paratyphoid A bacilli and 750 million killed paratyphoid B bacilli per cubic centimeter; in packages of ninety 1 cc. vials (thirty immunizations), being thirty sets of three doses, the first dose containing 500 million killed typhoid bacilli and 375 million each of killed paratyphoid A and B bacilli, the second and third doses containing, respectively, twice the number of bacilli in the first dose.

Typhoid-Paratyphoid A Vaccine.—Marketed in packages of one 5 cc. vial containing 750 million killed typhoid bacilli and 250 million killed paratyphoid A bacilli per cubic centimeter; in packages of one 15 cc. vial containing 750 million killed typhoid bacilli and 250 million killed paratyphoid A bacilli per cubic centimeter; in packages of one 30 cc. vial containing 750 million killed typhoid bacilli and 250 million killed paratyphoid A bacilli per cubic centimeter.

SCARLET FEVER IMMUNITY TEST (See New and Nonofficial Remedies, 1928, p. 392).

Parke, Davis & Company, Detroit.

Scarlet Fever Streptococcus Toxin for Preventive Immunization-P. D. & Co.—Prepared by the method of Drs. Dick under U. S. patent 1,547,369 (July 28, 1925; expires 1942) by license of the Scarlet Fever Committee, Inc. Marketed in packages of five vials of toxin (Bio. 157) containing, respectively, 500, 2,000, 8,000, 25,000 and 80,000 skin test doses; in packages of fifty vials of toxin (Bio. 158), ten containing 500 skin test doses, ten containing 2,000 skin test doses, ten containing 8,000 skin test doses, ten containing 25,000 skin test doses, and ten containing 80,000 skin test doses.

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED THE PUBLICATION OF THE FOLLOWING REPORT.

W. A. PUCKNER, Secretary.

NEISSER (GONOCOCCIC) VACCINE AND ERYSIPELAS VACCINE (NATIONAL DRUG COMPANY) NOT ACCEPTABLE FOR N. N. R.

Neisser (Gonococcic) Vaccine and Erysipelas Vaccine are marketed by the National Drug Company, Philadelphia. The former is prepared from the gonococcus bacteria of Neisser grown on an agar medium; the latter is prepared from hemolytic streptococci taken from patients having recurrent attacks of erysipelas.

In 1924 the Council omitted from New and Nonofficial Remedies all gonococcus vaccines because experience with such preparations had not established their value and because the Council's consultants concluded that gonococcus vaccine had no field of usefulness (THE JOURNAL, Jan. 17, 1925, p. 220). In 1925 the Council omitted from New and Nonofficial Remedies all streptococcus vaccines because experience had not established their value and because the Council's consultants concluded that streptococcus vaccine had no field of usefulness (THE JOURNAL, Jan. 23, 1926, p. 294).

The Council declared Neisser (Gonococcic) Vaccine and Erysipelas Vaccine (National Drug Company) unacceptable for New and Nonofficial Remedies.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JANUARY 5, 1929

THE TEACHING OF OBSTETRICS

Apparently few conceptions of medical practice have changed as little during the passing of the years as have those devoted to the care of the mother in childbirth. The teaching of this science at first entirely by lectures changed to the period of the use of manikins, then to the period when the student observed the work of his teacher, later to the period of one or two cases attended by the student, and now to the time when attendance on eighteen to twenty cases is required of every prospective physician. It is generally recognized, moreover, that scientific obstetrics requires much more than is today offered to the average student of medicine.

In his presidential address before the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Dr. Palmer Findley [1] pointed out that the outpatient service is a poor substitute for the dispensary and the hospital, and that there is no more virtue in teaching obstetrics in the amphitheater than in teaching operative surgery from the benches. In his opinion he has the support of such leaders in obstetrics as Theobald and Berkeley of England and of various leaders in medical education in this country. It is the consensus that the time allotted to obstetrics or midwifery in the medical college is all too brief and yet the same argument is made for every phase of medical practice. The obstetricians argue that their subject is fully equal in importance, particularly for the general practitioner, to internal medicine and to surgery, and that it should be allotted an equal number of hours. It is generally recognized that the maternal mortality of our country is too high. Dr. Findley feels that better teaching in obstetrics would do much to lower maternal mortality rates, certainly as much as the attempts that have been made to educate the public by pamphlets published under the Sheppard-Towner Maternity Act.

In his conclusion, Dr. Findley demands not less than one month devoted exclusively to maternity service for each medical student and actual delivery by the student, under the direction of trained clinicians, of at least twenty patients during this period. A committee of obstetricians, established by a resolution of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, is planning the creation of an American Board of Obstetrics and Gynecology with a view to certifying those physicians who may be able to satisfy the board of their qualifications in this field. The establishment of certificates of special competence in any of the medical specialties serves to stimulate young men to perfect themselves and to maintain standards of scientific practice, research and professional conduct above those of the rank and file. The American Board of Otolaryngologists, organized in 1924, had by June, 1928, granted certificates to 1,179 out of 1,261 candidates, thus indicating that some men had been unable to meet the qualifications demanded and that others had made special efforts through extra study to reach the high standards required. Possibly a similar board will stimulate higher study in the obstetric field.

1. Findley, Palmer: The Teaching of Obstetrics, Am. J. Obst. & Gynec. **16**: 611 (Nov.) 1928.

THE EXPERIMENTAL PRODUCTION OF FOOD POISONING

Food poisoning from the contamination of food with the paratyphoid-enteritidis group of bacteria is no doubt more prevalent than available statistics indicate. Most authorities agree that its clinical manifestations, namely, incubation period of several hours, abdominal pain, nausea, vomiting and diarrhea and sometimes fever, are those of an intoxication. The demonstration in the laboratory of a toxin or poison in the causative food, however, is apparently associated with technical difficulties. Even the production of experimental food poisoning with filtrates of known contaminated foods is unusually rare.[1] The explanation of the mechanism of the production of this type of poisoning from food has long been sought.

In many instances in alleged outbreaks no organism, toxin or poison can be demonstrated, nor can the absence of an infection following the ingestion of contaminated food be fully explained, at least when some strains of *B. paratyphosus* A and B are concerned and isolated. One difficulty to be surmounted has been to find a susceptible laboratory animal for experimental work. Branham and her associates [2] and more recently Dack, Cary and Harmon [3] and Dack, Harmon and Jarra,[4] all of the University of Chicago, have reported conflicting results in experiments performed. In experiments in which Branham used mice and reported delayed results (five, ten and fourteen days) Dack and his associates used rabbits, monkeys, human beings and one cat with practically negative results. All of these

1. Geiger, J. C.; Davis, E., and Benson, H.: Am. J. Pub. Health **14**: 578 (July) 1924. Geiger, J. C., and others: Ibid. **14**: 309 (April) 1924.
2. Branham, Sara E.; Robey, Lucille; and Day, Lois: J. Bacteriol. **15**: 36, 1928; Arch. Path. **5**: 742 (April) 1928.
3. Dack, Cary and Harmon: J. Prev. Med. **11**, number 6, 1928.
4. Dack, Harmon and Jarra: J. Prev. Med. **11**, number 6, 1928.

workers reported the use of heat-killed cultures, thereby simulating to a great extent the conditions usually found in outbreaks. Savage and White,[5] and Geiger and others [1] have sought for the intestinal irritant substances probably produced by the paratyphoid-enteritidis group. Gärtner,[6] as early as 1888, observed significant clinical and pathologic manifestations in mice fed with meat previously contaminated with *B. enteritidis* and heated for one hour at 100 F. Bahr and Dyssegaard [7] tested the toxicity of these organisms by injections of filtrates or boiled cultures.

Now, Geiger and Meyer [8] of the George Williams Hooper Foundation for Medical Research of the University of California apparently have solved the technical difficulties. These authors, in a preliminary report, record positive results when white mice are fed heated whole fluid cultures. The symptoms appear in a few hours and death usually occurs in from twelve to twenty-four hours. The pathologic picture described of a distended duodenum, the hyperemic jejunum and ileum and the pleural effusion were considered as pathognomonic for experimental food poisoning in mice. Rabbits, cats and guinea-pigs were not affected in the same manner but a monkey did show symptoms when fed with 10 cc. of a potent poison. Further report on the experimental production of this interesting clinical entity and the nature of the poison will be watched with interest.

NUTRITION AND LONGEVITY

Heredity, external environment, and nutrition are significant factors in determining the length of life. The significance of heredity is emphasized when the mode of inquiry is that of gathering data relating to persons who, at the time of selection, have already attained to noteworthy longevity. Without necessarily questioning the conclusion thus reached that heredity is probably the dominant factor in longevity, the thoughtful student will not fail to reflect that this method of investigation is fitted primarily to bring to light any correlation which may exist between the longevity of the individual and that of his parents and grandparents, whose ages at death will usually stand out as clear-cut quantitative data in such an inquiry. The method is less able apparently to establish correlations with the factors of external environment and of nutrition or food habit, because the environmental conditions of a lifetime cannot, in normal human experience, be ascertained with anything approaching the degree of definiteness with which hereditary factors may be determined. Hence the fact that inquiries of this sort heretofore have failed to establish satisfactory correlations between environment and longevity does not prove that the relationship does not exist; it is at least equally probable that the environmental factors may actually have a greater influence than has been demonstrated. Unfortunately, not all discussions of longevity have shown this discrimination. Too often the type of inquiry referred to has been taken to justify the view that nothing which a person can do for himself, or which can be done for him during his lifetime, will materially influence his length of life—a conclusion that far overreaches the available scientific evidence and carries a flavor of dogmatic fatalism rather than of modern medicine. Much of the available evidence offers good reason for believing in environment as a factor in longevity. To mention but one of many causes of death, is there not full justification for believing that many men who have died of pneumonia might have lived longer if they had been less exposed to infections and bad weather?

Broadly regarded, the nutritive condition of any person may be (doubtless in many cases is) influenced by inherited constitution and by external environment, as well as by the nutriment which he consumes. Moreover, even within the range of variation of what is considered a normal and adequate food supply, it now seems to have been demonstrated that the food which one consumes may influence one's longevity. Lifelong experiments and observations have not been made on human beings, for with them it is not feasible either to control the food intake for a lifetime or to find cases in which all other conditions have been constant while food habits have differed in known and definite ways. Both these conditions can be realized, however, in laboratory experiments with rats, and the chemistry and physiology of human and rat nutrition are sufficiently similar (allowing for the fact that the rat lives its life in about one thirtieth of the time of man) so that a nutritional principle established by experimentation with one of these species may, with a satisfactory degree of probability, be expected to apply to the other species as well.

In a recent study,[1] about 400 rats, all of the same heredity, and living under conditions alike in all other respects, were kept in about equal numbers on two different dietaries—both nutritionally adequate wheat-and-milk mixtures but differing in the proportions of milk in the food mixture. Although the diet with the lower proportion of milk was definitely shown to be adequate, the animals receiving food containing the higher proportion of milk lived, on the average, 10 per cent longer—a significant gain in longevity. Critical examination of the results from a statistical point of view indicated that there was not more than one chance in a hundred that this result could have been accidental or due to the natural physiologic variability of the animals. The superior longevity induced

5. Savage and White: Medical Research Council, Special Reports, series 91, 1925, p. 111.
6. Gärtner: Cor.-Bl. d. allg. arztl. Vereins v. Thüringen **17**: 590, 1888.
7. Bahr, I., and Dyssegaard, A.: Centralbl. f. Bakteriol. **102**: 268 (May 12) 1927.
8. Geiger and Meyer: Proc. Soc. Exper. Biol. & Med. **26**, number 2, 1928.

1. Sherman, H. C., and Campbell, H. L.: Proc. National Acad. Sc. **14**: 852-855, 1928.

by the improvement of the already adequate diet was further shown in the fact that much larger percentages, both of males and of females, attained definite standards of longevity on the improved than on the original dietary. The investigators also point out that this gain in longevity resulted from a single and simple dietary improvement, and that it is altogether probable that the better of the two diets here studied is susceptible of being still further improved. Hence it is entirely reasonable to hope that further investigation may show possibilities of even more gratifying improvements in longevity, through the application of the constantly growing knowledge of nutrition.

MEDICAL SATIRE

A profession that has always taken itself as seriously as has the medical profession would obviously be among the first to attract the arrows of the satirists. Hardly a satirical writer is known who has not aimed his weapon at the physicians. Satire is humor with a purpose, directed to achieve a definite object. Ridicule is a potent force and one of the most useful of all forces that can be wielded in the combat against folly. It serves to correct departures from logic and reason, to diminish exaggeration, to indicate the fallacy of overemphasis or unwarranted dignity. In the Shakespearian plays there are numerous references to the doctor, as also in the comedies of Molière. In Gulliver's Travels, in which Jonathan Swift deals with life among the Yahoos, sharp barbs are tossed into the practices then universal of purging by drugs and by enemas. Dr. Sangrado in Gil Blas attacks the venesection which was the fad of the time.

Satire is the inevitable response to a display of overmuch pomp, dignity, exaggeration or stubbornness. Dr. Charles L. Dana pointed out that the ostentation and show assumed by some medical men in order to carry out the appearance of ability and knowledge that they do not possess offered exceptional opportunity to the satirists, as did the foolishness of many consultations, medical disagreements, outworn medical etiquette, fees, and the limitations of medical knowledge. About 1908, *Life* began a series of attacks on the medical profession and on animal experimentation, apparently because its editor was a devotee of osteopathy. Holländer[1] in "Die Karikatur und Satire," and Chauncey D. Leake[2] in an article on "Medical Caricature in the United States," have made excellent reviews of the subject. Toward the end of the nineteenth century a Galician physician named Isaac Erter wrote a satire on doctors which is typical perhaps of the heaviness of European humor as contrasted with the American type. Thus, the first of his statements reads, "Whiten your hair with dust, and put a camel's pillow on your stomach. You will then be considered wise by all who look upon you, for they will say, 'Great problems turned his hair white, and his learning is within him.'" The American equivalent of this might be "The average citizen prefers a physician with a 48 inch waist measure to one with a 48-caliber brain."

From time immemorial ridicule has been poked at the costume of the physician, his horses, his car, his simulation of prosperity as a means of attracting patronage and extraordinary fees. In Bernard Shaw's play "The Doctor's Dilemma," and in a play recently written by Jules Romain entitled "Knock, or the Triumph of Medicine," physicians are satirized by modern dramatists. It is reported that the author, in reality Louis Farigoule, wrote his play because physicians would not swallow his views on extraretinal vision.

1. Holländer, Eugene: Medizin, ed. 2, Stuttgart, 1921.
2. Leake, C. D.: Bull. Soc. M. History, Chicago 4:1 (April) 1928.

Current Comment

VITAMIN A AND PIGMENT

After it had been discovered that butter and cod liver oil contained an essential dietary factor, many experiments were initiated to study the distribution of this vitamin in nature. Vitamin A has been found, among other places, in the liver oils of many kinds of fish as well as of other animals, in kidneys, egg yolk, alfalfa, spinach, yellow corn, sweet potatoes, oranges and carrots. There is a striking though not invariable parallelism between the content of vitamin A and the yellow color of many fruits and vegetables. Thus white potatoes and white corn are very poor sources of the antiophthalmic factor, whereas yellow sweet potatoes and yellow corn contain the vitamin in considerable concentration. This observation early led to the inference that the yellow pigment and the fat soluble factor might be identical, an assumption that was not warranted, as further investigation showed. White corn is inferior to the yellow variety from the nutritive point of view so far as it is deficient in vitamin A, yet in many parts of the country white corn is preferred to the yellow kind. If the relation between color and vitamin content of yellow corn is a generic one, the vitamin should be transferred to the white corn by suitable breeding operations. Hauge and Trost[1] have recently reported experiments designed to answer the question involved. The yellow color of the endosperm is transmitted in mendelian ratio. It is comparatively simple, therefore, to select the kernels representing the various hybrid generations as well as the pure strains. These were fed to rats as the only source of vitamin A in an otherwise satisfactory ration. The results are clear cut and show that only those grains that were yellow contained demonstrable amounts of vitamin A; the kernels that were hybrid yellow were as rich in the food factor as those of pure strain yellow. It appears, therefore, that the antiophthalmic factor is transmitted through the process of crossing and segregation only with the yellow pigment.

1. Hauge, S. M., and Trost, J. F.: J. Biol. Chem. 80: 107, 1928.

There does not occur a genetic transfer of vitamin potency apart from color in the varieties of dent corn employed in these studies. Aside from their academic interest, these results are of considerable importance for, though the limitations of white corn probably matter little in human dietaries unless extremely restricted, the profitable feeding of farm animals under present-day conditions may well be influenced by these observations.

THE THYROID GLAND AND COMMUNICABLE DISEASE

Most American students of endemic goiter would subscribe no doubt to a recent statement [1] of an official of the United States Public Health Service that in all probability the disorder is due to either an absolute or a relative deficiency of iodine. By an absolute deficiency is meant an absence of iodine from food and water customarily consumed. Deprived of an element essential to its efficient functioning, the thyroid undergoes compensatory hypertrophy. Enlargement may also follow a relative deficiency of iodine. Demands for iodine in excess of available amounts often cause simple thyroid enlargement during puberty, pregnancy and lactation. He adds that interference with the intake and utilization of iodine available in ample quantity, such as probably occurs in infections and intoxications, or when partaking of abnormal food combinations, also causes simple goiter. Nevertheless there are not a few persons who regard infection as a significant cause of goiter. The writings of the British army surgeon McCarrison,[2] in particular, have helped to convey the impression that there is a *contagium vivum* to be considered, aside from the iodine factor. Advocates of this doctrine will receive little support from the recent report of Olesen,[1] who has made an extensive study of the effects of communicable disease on the size of the thyroid glands of hundreds of Cincinnati school children. The census of about 8,000 boys and an equal number of girls showed little difference in percentage incidence among the thyroid-normal and thyroid-enlarged children who had the same maladies. According to Olesen, who has had exceptionally extensive experience with endemic goiter problems, there is some evidence to show that one of the immediate effects of communicable diseases among girls of elementary school age is a simple enlargement of the thyroid gland. However, this thyroid enlargement appears to be temporary in character. A comparatively short time, the length of which is as yet undetermined, after a child recovers from a communicable disease, he is no more prone to changes in thyroid size than a child who has not had a communicable disease. So far as elementary school children are concerned, Olesen adds, there appears to be no ground for assuming that the ordinary communicable diseases are responsible for simple goiter. The underlying causes of this malady must be sought for in other directions.

1. Olesen, Robert: The Thyroid Gland and Communicable Diseases, Pub. Health Rep. 43: 3009 (Nov. 16) 1928.
2. McCarrison, Robert: The Thyroid Gland in Health and Disease, 1917.

Association News

THE PORTLAND SESSION

Portland Hotels

The Local Committee of Arrangements for the Portland Session reports that requests for hotel reservations are being received from Fellows in all parts of the country, which indicates a widespread interest and a large prospective attendance at the session. Reservations have already been booked for Fellows in fifteen states. An experienced hotel man has been placed in charge of hotel arrangements, and definite assignments are being made to the various hotels. A printed "Hotel Reservation" form is being used which indicates the name of the hotel and the type of accommodation reserved. One copy of this form is sent to the one requesting a reservation and another copy is sent to the hotel.

The committee asks that those desiring reservations indicate the hotel of their choice, the type of accommodations desired, and, so that duplication may be avoided, the names of the persons who will occupy the rooms. *All requests for reservations should be addressed to Dr. E. A. Sommer, Electric Building, Portland, Oregon.*

The rates quoted in the following list of Portland hotels and apartment hotels are for one or two persons in each room, unless otherwise indicated.

Portland Hotels

Name	Without Bath	With Bath
Adler		$5.00
Angela	$3.00	5.00
Arthur		5.00
Bellevue	2.00–3.00	
Benson		6.00–10.00
Bridgeport	2.00	3.00
Byron	3.00	5.00
Campbell		5.00
Campbell Court		5.00–6.00
Campbell Hill	3.00	4.00
Caples	4.00	7.00
Carlton		6.00
Carlyle	3.00	4.00
Carroll		3.50
Chamberlain	2.00	3.00
Clifford	2.00	3.00
Clyde		5.00
Commodore		5.00–6.00
Congress		6.00–7.00
Conradine		4.00
Cornelius	3.00	5.00
Eaton		4.00
Gordon		5.00 *
Hamilton	2.00	3.00 *
Heathman		6.00
Hillcrest	3.00	4.00 *
Hoyt	3.00	6.00
Imperial	3.50	4.00–8.00
Lenox	3.00–4.00	5.00
Loraine		4.00
Mallory		5.00–7.00
Montana		3.00
Morris	3.00	5.00
Multnomah	3.50	4.00–8.00
Navarre	$3.00–$6.00	
Nortonia	3.00	5.00
Oregon	4.00	6.00–7.00
Palace		5.00 *
Perkins	3.00	5.00
Portland	3.50–4.00	5.50–7.00
Prince of Wales		6.00
Ritz		5.00
Roosevelt		6.00
Rosaria		5.00
Roseland	3.00	5.00
Rowland	3.00	4.00 *
Seward	3.00	4.00–5.00
St. Andrews		5.00
St. Francis	3.00	5.00
Sovereign		6.00–7.00
Treves	3.00	
Washington	3.00–4.00	5.00–6.00 *
Y. M. C. A.	1.50 Single 2.00 Double	

Portland Apartment Hotels

Admiral (2 room)	5.00
Cromwell (2 and 3 room)	5.00–10.00
Doricourt (2 and 3 room)	4.00– 6.00
Empress	5.00
Lafayette	4.00– 5.00
San Carlos	5.00–10.00
Wheelden Annex (3 room connecting bath)	6.00
Wheelden Annex	3.00

* Connecting bath.

Scientific Exhibit

The Scientific Exhibit for the Portland, Oregon, Session, July 8-12, 1929, will be located in the Portland Public Auditorium; in this building will also be housed the Registration Bureau, Technical Exhibits, and a few of the sections of the Scientific Assembly.

The Committee on Scientific Exhibit emphasizes that exhibits should be presented in a way that will stress their scientific value. This may be done by carefully worded explanatory placards but particularly by personal demonstration, which is one of the committee's requirements. Also it should be remembered that the general attractiveness of the exhibit is essential; the committee will do its part by having the booths decorated appropriately and will furnish uniform signs giving the name of the exhibitor and the title of the exhibit; a uniform shelf with covering also will be provided. The total amount of space available in Portland is somewhat less than that which was available at the 1928 meeting in Minneapolis. From the interest already manifested in the next Scientific Exhibit, it is evident that large blocks of space cannot be assigned to individual exhibitors.

Of particular incidental interest is the decision that for the present all exhibits for the Central Scientific Exhibit at Headquarters must come through the annual Scientific Exhibit. A description of the Central Scientific Exhibit appeared in THE JOURNAL, Dec. 8, 1928.

Application blanks for the Scientific Exhibit may be obtained by sending requests for them to the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

Applications must be received before April 1. In order that the amount of space available may be apportioned to the best advantage to all concerned, the committee will make no assignments previous to April 20.

MOTION PICTURE THEATER OMITTED

The Motion Picture Theater will be omitted as a feature of the Portland Session. It is anticipated, however, that this will be resumed at the 1930 session if suitable facilities are found.

Local Committee on Scientific Exhibit

The chairman of the Local Committee of Arrangements for the Portland Session announces the appointment of the following as the Local Committee on Scientific Exhibit: Dr. Robert L. Benson, chairman; Dr. Robert C. Coffey; Dr. Laurence Selling.

Railroad Rates to Portland

The Transcontinental Passenger Association has announced that before the time of the Portland Session the regular summer excursion fares, which are lower than the usual convention rates, will be in effect from all points east of and including El Paso, Texas; Albuquerque, New Mexico; Ogden and Salt Lake City, Utah, and the state of Montana.

It has also been announced by the Tariff Publishing Agent at San Francisco that the lowest fares available from points in California and from Reno, Nevada, will be the sixteen day summer excursion fares; from points in Arizona, fares for summer excursion tickets limited to October 31, and from points in Nevada, east of Reno, passengers may purchase one month tickets to Reno and then sixteen day summer tickets to Portland, Oregon.

The Pacific Northwest Convention Bureau has authorized the round trip rate of fare and one-half on the Identification Certificate Plan from points in Idaho, Washington and Oregon (except on the Southern Pacific) and from stations on the Great Northern in British Columbia. A member or Fellow living in these states who expects to attend the annual session at Portland, Oregon, is requested to write the American Medical Association for one of the Identification Certificates, which will entitle him and dependent members of his family to purchase a round trip ticket to Portland at a rate of one and one-half fares. The dates of sale of these tickets will be from July 4 to July 10, inclusive. The final return limit will be July 16.

The Southern Pacific Railroad Company announces that it will have in effect from all stations on its lines in Oregon round trip fares to Portland which are on a lower basis than on the Identification Certificate Plan outlined.

ANNUAL CONGRESS ON MEDICAL EDUCATION, LICENSURE AND HOSPITALS

Preliminary Program of Meetings to Be Held in Chicago, Feb. 18, 19 and 20, 1929

The next conference of the Council on Medical Education and Hospitals will be held in the Palmer House, Chicago, February 18, 19 and 20. The preliminary program follows:

MEDICAL EDUCATION

RELATIONSHIP OF MEDICAL EDUCATION TO THE COST OF MEDICAL CARE. Ray Lyman Wilbur, M.D., president, Stanford University, Calif.

RELATIONSHIP OF THE FUNDAMENTAL LABORATORY TO CLINICAL TEACHING. Hans Zinsser, M.D., professor of bacteriology and immunology, Harvard University Medical School, Boston.

EDUCATIONAL RELATIONS OF THE PROFESSIONS. David A. Robertson, A.B., assistant director, American Council on Education, Washington, D. C.

MODERN TEACHING OF CLINICAL MEDICINE

TEACHING OF MODERN SURGERY. Dean Lewis, M.D., professor of surgery, Johns Hopkins University School of Medicine, Baltimore.

THE TEACHING OF MEDICINE. Ralph H. Major, M.D., professor of medicine, University of Kansas School of Medicine, Kansas City.

TEACHING OF PEDIATRICS IN A MODERN HOSPITAL. Julius H. Hess, M.D., professor of pediatrics, University of Illinois College of Medicine, Chicago.

TEACHING OF RELATED MEDICAL SUBJECTS

NEEDED DEVELOPMENTS IN GRADUATE MEDICAL EDUCATION. Edward H. Hume, M.D., director, New York Post-Graduate Medical School and Hospital, New York.

A MEDICAL SCHOOL'S EFFORT TO SUPPLY PHYSICIANS FOR RURAL COMMUNITIES. Thomas Ordway, M.D., dean, Albany Medical College, Albany, N. Y.

PERIODIC HEALTH EXAMINATIONS AS A PART OF A MEDICAL STUDENT'S CURRICULUM. Reginald Fitz, M.D., associate professor of medicine, Harvard University Medical School, Boston, and member of the Council on Medical Education and Hospitals.

MEDICAL SCHOOLS AND TEACHING HOSPITALS

UNIVERSITY HOSPITAL, COMMUNITY AND THE PRACTICING PHYSICIAN. Henry S. Houghton, M.D., dean, State University of Iowa College of Medicine, Iowa City.

THE HOSPITAL SECTION OF THE DUKE ENDOWMENT AND THE MEDICAL SCHOOL. W. S. Rankin, M.D., director, Hospital and Orphan Sections, the Duke Endowment, Charlotte, N. C.

THE TEACHING HOSPITAL AND THE MEDICAL SCHOOL. Richard M. Dillehunt, M.D., dean, University of Oregon Medical School, Portland.

THE HOSPITAL INTERNSHIP

THE INTERNSHIP AS A REQUIREMENT FOR THE MEDICAL DEGREE. William Darrach, M.D., dean, Columbia University College of Physicians and Surgeons, New York.

ROUTINE DUTIES OF AN INTERN. L. S. Schmitt, M.D., associate dean, University of California School of Medicine, San Francisco.

SUGGESTED PROGRAM FOR THE INTERN. Christopher G. Parnall, M.D., Medical director, Rochester General Hospital, Rochester, N. Y.

HOSPITAL STAFF CONFERENCES

THE HOSPITAL STAFF CONFERENCE. Frank J. Sladen, M.D., physician-in-chief, Henry Ford Hospital, Detroit.

AUTOPSIES AND THE HOSPITAL STAFF CONFERENCE. Bernard Steinberg, M.D., pathologist, Toledo Hospital, Toledo, Ohio.

AUTOPSIES AND THE HOSPITAL STAFF CONFERENCE. Jefferson H. Clark, M.D., pathologist, Samaritan Hospital, Philadelphia.

LABORATORY CONFERENCE

THE HOSPITAL CLINICAL LABORATORY. William A. O'Brien, M.D., assistant professor of pathology, University of Minnesota Medical School, Minneapolis.

EXTENDED ROUTINE LABORATORY SERVICE IN PRIVATE HOSPITALS. Ralph Kinsella, M.D., professor of medicine, St. Louis University School of Medicine, St. Louis.

THE HOSPITAL CLINICAL LABORATORY. Carl W. Apfelbach, M.D., pathologist, Presbyterian Hospital, Chicago.

CONFERENCE ON RADIOLOGIC LABORATORIES

THE RADIOLOGIC LABORATORY. A. U. Desjardins, M.D., Section of Radium and X-Ray Therapy, Mayo Clinic, Rochester, Minn.

THE RADIOLOGIC LABORATORY FROM THE STANDPOINT OF THE CLINICIAN. Ralph Pemberton, M.D., Philadelphia.

RADIOLOGY. William E. Chamberlain, M.D., radiologist, Stanford University Hospital, San Francisco.

STATE LICENSURE

THE RELATION OF THE FEDERATION TO MEDICAL SCHOOLS. Hugh Cabot, M.D., dean, University of Michigan Medical School, Ann Arbor, Mich.

THE FEDERATION AND THE MEDICAL PROFESSION. Ray Lyman Wilbur, M.D., president, Stanford University, Calif.

DISCIPLINE OF THE LICENSED PRACTITIONER. P. T. Phillips, M.D., president, California Board of Medical Examiners, Santa Cruz, Calif.

THE VALUE OF A GRIEVANCE COMMITTEE AS A PART OF THE MEDICAL PRACTICE ACT. Orrin Sage Wightman, M.D., chairman, Grievance Committee of New York State, New York.

THE STATE EXAMINING BOARD AS AN AGENCY OF MEDICAL PROGRESS. J. H. J. Upham, M.D., member, Ohio State Medical Board, Columbus, Ohio.

UNIFORM QUALIFICATIONS FOR LICENSURE AND ENFORCEMENT. Harry Eugene Kelly, attorney, Chicago.

CARE OF CONVALESCENTS

The American Conference on Hospital Service will participate in the congress, rendering a program on "The Care of Convalescents."

REDUCED RAILWAY FARES

Reduced railway fares for this congress have been assured by the several railway associations. The number of those attending the congress and members of their families who have purchased one-way tickets amounting to 67 cents or more must number at least 250. Each one attending the congress, therefore, should purchase a one-way ticket to Chicago and obtain from the local agent a certificate receipt. This receipt, after being countersigned by an official of the congress at the Palmer House, will entitle its holder to a return fare at one-half rate.

MEDICAL BROADCAST FOR THE WEEK

The American Medical Association Morning Health Talks and Evening Health Hints from Hygeia

The American Medical Association broadcasts daily at 10 o'clock in the morning, central standard time, over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week of January 7 to 12 will be as follows:

January 7. "How to Select a Doctor," by Dr. N. P. Colwell.
January 8. "What Causes Insanity?" by Dr. R. G. Leland.
January 9. "Medical News," by Dr. J. F. Hammond.
January 10. "Treating Crippled Children," by Dr. R. G. Leland.
January 11. "Tuberculosis," by Dr. James O. Nall.
January 12. "Rheumatism," by Dr. R. G. Leland.

Evening Health Hints from Hygeia at 8 o'Clock, Central Standard Time

January 7. If Your Hands and Face Chap.
January 8. Ice Skating, King of Winter Sports.
January 9. Ferry Boat Schools.
January 10. Whooping Cough.
January 11. The Motorist and the Child.
January 12. In the Land of Pyramids.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARIZONA

Increase in Mental Patients.—There were 181 first admissions to the Arizona State Hospital during 1927, as compared with 169 in 1926 and 209 in 1922. Of the first admissions in 1927, 125 were males and fifty-six females. While the number of patients under treatment in the hospital has increased steadily from 337 on Jan. 1, 1910, to 704 on Jan. 1, 1928, there has been a decrease in the number of first admissions relative to the population of the state, as shown by the fact that in 1922 they numbered 55.9 per hundred thousand of population as compared with 39.4 in 1927. These figures are preliminary and subject to correction.

CALIFORNIA

Fund for Treatment of Brain Tumors.—An alumnus of the University of California, Dudley Cates of Winnetka, Ill., has given $25,000 a year for the next five years for intensive study of neurologic surgery, with special reference to the treatment of brain tumors. The research work will be under the direction of Dr. Howard C. Naffziger, clinical professor of surgery, at the university medical school in San Francisco. While the donor is anxious to see the technic of the removal of brain tumors improved, he has not put any limitation on the surgical research which may be done in the field of neurology.

Public to See the Canti Film.—The first exhibition of the Canti Cancer Film intended primarily for the public in California has been arranged by the University of California for January 22 at the University Extension Building, 540 Powell Street, San Francisco, and the following Tuesday evening, January 29, at the Wheeler Auditorium in Berkeley. The three reel film, which depicts the growth of the normal and cancer cells and the effect of radium on them, will be explained by Charles A. Kofoid, Ph.D., of the department of zoology. It has been shown several times to scientific groups in the state and has been enthusiastically received.

Society News.—Dr. Alfred Adler, psychiatrist of Vienna, Austria, will lecture in Berkeley, Wednesday, February 6, at the Wheeler Auditorium and on the following evening in San Francisco at the University Extension Building, 540 Powell Street. Dr. Adler is the founder of the *International Journal of Individual Psychology*.——Influenza cases reported to the state department of health, for the week ending December 8, amounted to 10,296, while the number for the corresponding week the previous year was 21.——The franchise of the Berkeley Chiropractic College and High School, Berkeley, was revoked, November 28, by Judge Trabucco, who is reported to have denounced the school as a "public nuisance" and "diploma mill."——At a meeting of the California Medical Golf Association, Hollywood Country Club, December 19, sixty members played and dined. The winner in class A (gross) was Dr. Louis Felsenthal.——Dr. Henry L. Holzberg has been elected president of the San Francisco Optimist Club.

DISTRICT OF COLUMBIA

Personal.—Louise Stanley, Ph.D., chief, bureau of home economics, U. S. Department of Agriculture, has been appointed an official representative of the department on the American Standards Association, which for about ten years has been serving as a federation of national organizations interested in the standardization movement.——Dr. Joseph Goldberger, well known for his work on pellagra, is seriously ill at the naval hospital, Washington, from anemia, the cause of which the attending physicians are as yet unable to explain. A score of fellow officials of the U. S. Public Health Service with which Dr. Goldberger has so long been connected volunteered as donors when transfusion was found necessary. This is the second instance of a well known member of the public health service who has recently suffered at least a temporary loss of health while in the performance of his duties. Dr. Edward Francis is still in the naval hospital, suffering from undulant fever which he contracted while carrying on investigations in the Hygienic Laboratory.

FLORIDA

Medicine Maker Sentenced.—Judge Jones, December 5, sentenced J. E. Roberts of Armstrong, a negro claiming the ability to cure tuberculosis and cancer by medicines of his own make, to the federal penitentiary, Atlanta, for seven years. Roberts came to Florida about three years ago from North Carolina, according to the *Journal of the Florida Medical Association*. He sent his medicine through the mails and was convicted for using the mails to defraud. Local and federal authorities cooperated in obtaining evidence and prosecuting the case.

Society News.—The Leon-Gadsden-Liberty-Wakulla-Jefferson County Medical Society was addressed at Chattahoochee, recently, by Dr. James H. Pound on "Pellagra with Psychoses"; Dr. Frank E. Daves, "Tuberculosis of the Kidney"; Dr. C. K. Wall, Thomasville, Ga., "Hysterectomy versus Suspension in Selected Cases"; J. B. Game, D.D.S., Tallahassee, "Oral Foci of Infection," and B. V. Danheiser, D.D.S., Pensacola, "Focal Infection from a Dentist's Viewpoint."——The Putnam County Medical Society held its annual banquet, December 13, at Palatka. Drs. Herman Marshall Taylor, Jacksonville, spoke on tuberculosis of the throat; W. M. Shaw, Jacksonville, "Use of the Roentgen Ray in Surgery," and Edward Jelks, Jacksonville, "Intestinal Obstruction."

IDAHO

Hospital News.—St. Luke's Hospital, Boise, opened its new addition, October 24; about 3,000 visitors inspected the building.——Dr. Charles A. Kearney has come to the U. S. Veterans' Bureau Hospital at Boise from the veterans' hospital at Knoxville, Iowa.

Decrease in Death Rate.—The death rate for Idaho for 1927 was 709 per hundred thousand of population, as compared with 742 in 1926. The principal decreases were from

influenza, enteritis under 2 years, pneumonia and whooping cough. The principal increases were from heart disease, cancer, measles, appendicitis and typhilitis.

INDIANA

Society News.—Among others, Dr. Alois B. Graham addressed the Indianapolis Medical Society, December 11, on "Action of Quinine in Cases of Chronic Constipation."——Dr. Arthur F. Weyerbacher, Indianapolis, has been elected commander of the Paul Coble Post number 26 of the American Legion for the ensuing year.——The St. Joseph County Medical Society, South Bend, conducted clinics at the St. Joseph Hospital, November 21, during its annual meeting. Drs. Albert E. Sterne, Indianapolis, Julius H. Hess, Chicago, Charles P. Emerson, Indianapolis, Waltman Walters, Rochester, Minn., and P. G. Skillern, James V. Cassaday, James L. Wilson, John B. Berteling and Milo K. Miller were on the program.——The Muncie Academy of Medicine, Muncie, will be addressed, January 14, by Dr. George E. McKean, Detroit, on "The Treatment of Pneumonia"; February 5, by Dr. Udo J. Wile, Ann Arbor, Mich., and March 5, by Dr. Louis J. Hirschman, Detroit.——At the thirteenth annual meeting of the Indiana Society for Mental Hygiene, Indianapolis, December 10, Dr. Herman M. Adler, Chicago, spoke on "What Psychiatry Can Do to Prevent Crime." Other speakers included Dr. Max A. Bahr, superintendent of the Central State Hospital, on personal observations of the insane. The society recommended at this meeting the establishment of a psychiatric hospital of at least 100 beds in Indianapolis for the treatment of mental patients voluntarily seeking admission and of patients transferred from other institutions.——Dr. Albert E. Bulson, Jr., Fort Wayne, was elected president of the Indiana Academy of Ophthalmology and Otolaryngology at the twelfth annual meeting, Indianapolis, December 13.——Dr. Harold S. Hatch has resigned as superintendent of Sunnyside Sanatorium, Indianapolis, effective January 1.

IOWA

Society News.—The Upper Des Moines Medical Association was addressed, December 4, at Estherville, by Dr. Frank A. Ely, among others, on "Neuropsychiatric Complications of Common Diseases," and by Dr. Lee F. Hill on "Feeding of Infants," illustrated with lantern slides.——The Sioux Valley Medical Association will hold its midwinter meeting in Sioux City, January 22-23, under the presidency of Dr. Charles P. Dolan, Worthington, Minn.——The Lee County Medical Society, Fort Madison, was addressed, December 20, by Dr. Thomas Noxon Toomey, St. Louis, on "Pruritis and Dermatitis of Internal Origin."

KANSAS

Society News.—The Shawnee County Medical Society was addressed, December 3, by Dr. John A. Wolfer, Chicago, on "Chronic Duodenal Obstruction," preceding a dinner, and afterward on "The Acute Abdomen." The society elected Dr. James Stewart, Topeka, president at this meeting.——The Clay County Medical Society, Clay Center, conducted a symposium on thyroid disease, November 21; the speakers were Drs. Harold P. Kuhn and Robert C. Davis, Kansas City, Mo., and Dr. Ferdinand C. Helwig, Kansas City, Kan.

MAINE

Chiropractor Buzzell Sentenced.—Prescott A. Buzzell, a chiropractor of Portland, is reported to have been sentenced, October 9, to eight months in jail, following an alleged illegal operation on Alice Furlong of Limerick. The chiropractor was arraigned as a second offender.

License Suspended.—The state board of registration of medicine at a meeting, November 13, suspended indefinitely the license of Dr. Israel E. Rudman, Bangor, who was convicted and jailed for a criminal abortion. Dr. Rudman is said to be ill and unable to attend the hearing. The board took this action until such time as he is able to appear.

MASSACHUSETTS

Sentenced for Illegal Operation.—Dr. John J. Donoghue, 10 Vernon Street, Worcester, according to the *New England Journal of Medicine*, has been convicted by a jury of an alleged illegal operation which is said to have caused the death of a woman, and has been sentenced to jail. His registration was revoked more than a year ago.

Hospital News.—The Massachusetts General Hospital has awarded contracts for the new hospital for people of moderate means amounting to nearly $1,500,000, which includes the removal of two ward buildings now on the site. The funds have not been entirely raised, but the trustees believe that the public will respond. The ward buildings to be removed are the Bigelow ward and the Townsend ward, both historic, having been built in 1874 and 1875, respectively, and intended then for temporary use. They are of the single story pavilion type. Work on the new undertaking will begin at once.

Personal.—Dr. Merrill E. Champion has resigned as director of the division of hygiene of the Massachusetts State Department of Public Health and was succeeded, January 1, by Dr. M. Luise Diez of the New York State Department of Health.——Dr. Arthur S. Hartwell, Norwood, has been appointed medical examiner of the first Norfolk district by the governor.——Dr. Abraham Myerson, professor of neurology, Tufts College Medical School, Boston, addressed the Somerville Medical Society, December 5, on "Crime and Criminals." At this meeting, Dr. Edmund H. Robbins was reelected president of the society.

Appointments at Harvard.—The following additional appointments to the faculty of Harvard University Medical School were noted in the *New England Journal of Medicine:* Richard Cannon Eley, assistant in pediatrics, one year from September 1; Haqvin Malmros, research fellow in biologic chemistry, one year from September 1; John Reginald Cuff, research fellow in pathology, one year from September 1; Moses Ralph Kaufman, research fellow in psychiatry, from Nov. 1, 1928, to Sept. 1, 1929; John Archibald Ferguson, instructor in pathology, from January 1 to September 1. The following changes of title for one year from September 1 are noted: Arthur Moses Greenwood, instructor in dermatology; Clarence Guy Lane, instructor in dermatology.

MICHIGAN

Society News.—The Muskegon County Medical Society was addressed, December 7, by Dr. Clifton F. McClintic, Detroit, on "Alcoholic Injection of the Arteries for Chronic Ulcers."——Dr. Andrew L. West has been reappointed health officer of St. Joseph with the title of director of public health.——The Oakland County Medical Society reelected Dr. Frederick A. Baker, Pontiac, president at the annual meeting, December 13.——Dr. Leon M. Bogart has resigned as secretary of the board of managers of Hurley Hospital, Flint.

Quackery at Low Ebb.—A van load of "therapeutic apparatus" was carted away from the office of Detroit's "Doctors for Men," 1039 Farmer Street, December 4, the owners, according to the *Free Press*, having given up the "ghost of quackery." Some months ago the Wayne County Medical Society requested the aid of the state police in combating quackery and raids were made on about a score of offices; some of the "keepers" were arrested; others fled. Other offices that have closed since the medical society took action are said to be the Imperial Medical Specialists, 515 Woodward Avenue; the Central Medical Office in the Liggett Building; the Michigan Medical Specialists, Abbott Street and Michigan Avenue, and the Woodward Clinic, 544 Woodward Avenue (THE JOURNAL, July 21, p. 179).

MINNESOTA

Hospital News.—At the laying of the cornerstone of the Minnesota Hospital and Home for Crippled Children at the University of Minnesota, November 10, the president of the board of regents, Mr. Fred B. Snyder, reviewed the life of the donor of the building, William Henry Eustis, formerly mayor of Minneapolis, who himself was a cripple; other speakers were Dr. Charles H. Mayo, Rochester; Dr. Elias P. Lyon, dean of the medical school, and Lotus D. Coffman, LL.D., president of the university.

Society News.—Dr. C. Levaditi, Paris, France, gave an illustrated lecture at the Mayo Clinic, November 26, on "Metallic Therapy of Syphilis."——Dr. George B. Eusterman addressed the Rice County Medical Society, Northfield, November 26, on "Appraisal of Newer Methods in the Diagnosis of Cholecystic Disease."——The Minnesota Academy of Ophthalmology and Oto-Laryngology was addressed in December at Minneapolis by Dr. George F. Suker, Chicago, on "Lesions of the Visual Pathway," illustrated with specimens.——Medical extension lectures to be given before the St. Louis County Medical Society, Duluth, have been arranged as far ahead as March. The January program will be Drs. Leo G. Rigler, Minneapolis,

on "Anomalies in Roentgenography," and Edward L. Miloslavich, Milwaukee, on "Parthogenesis of the Tubercles"; the February program will be by Drs. William S. Middleton, Madison, Wis., on "Industrial Factors in the Production of Lung Diseases," and George E. Fahr, Minneapolis, on "Functional Heart Disease and the Systolic Murmur"; the March program will be by Dr. Ralph M. Waters, Madison, Wis., on anesthesia.

MISSISSIPPI

Personal.—Dr. Bron D. Blackwelder has been elected director of the full-time county health unit, which is to be established with headquarters at Natchez about January 1. Dr. Blackwelder has been engaged in public health work in Lexington in Holmes County.——Dr. Henry E. Austin of the East Mississippi Insane Hospital, Meridian, has been appointed chief medical officer of the veterans' bureau hospital, Philadelphia, and was to leave about December 15.——Dr. William R. May, Amory, has been appointed head of the new Lincoln County health unit.——Dr. Martin L. Flynt has been made president of the Newton Infirmary, Newton, which was formally opened, December 8.

Society News.—The Clarksdale and Six Counties Medical Society held its fifty-third semiannual meeting, November 7; among others, Drs. James A. Slack, Friars Point, spoke on malaria, and Leon H. Brevard, Dundee, on plasmochin. Following the banquet, Dr. Felix J. Underwood, Jackson, state health officer, spoke.——Forty-seven children examined at the Crippled Children's Clinic at Oxford in Northeastern Mississippi in December were recommended for treatment. The Mississippi Society for Crippled Children was assisted in this work by the local clubs and medical students from the university.——The Coahoma County physicians decided to organize a county society; the first meeting was set for December 5. ——The Issaquena-Sharkey-Warren Counties Medical Society was addressed at Vicksburg, December 11, by Dr. John H. Musser, professor of medicine, Tulane University of Louisiana School of Medicine, New Orleans, on "Throat Infections in General Medicine"; by Dr. Eugene M. Holder, professor of surgery, University of Tennessee College of Medicine, Memphis, on goiter, and by Dr. Guy A. Caldwell, Shreveport, La., on "Mechanism of Reduction of the More Common Fractures." Dr. Arthur T. McCormack, Louisville, Ky., addressed this meeting on "The Doctor's Duty to the Community in the Prevention of Disease"; Dr. Winston C. Pool, Cary, was elected president of the society for the ensuing year.——The South Mississippi Charity Hospital, Laurel, was closed to new patients early in December because of influenza among the patients and personnel.——A conference of county health officers and sanitary inspectors was held in Jackson, December 11-13; the program comprised twenty-three addresses; some of the speakers were from adjoining states.

NEW JERSEY

Personal.—Dr. Elmer G. Wherry has been appointed medical director of the Babies' Hospital of Newark to succeed the late Dr. Eugene W. Murray. Dr. Wherry is a past president of the Essex County Medical Society and a former secretary of the New Jersey Pediatric Society.

Hospital News.—The New Jersey State Department of Institutions and Agencies acquired a site, December 27, for $76,500, to be used for a new $4,000,000 state hospital for mental diseases at Wickatunk on the Freehold-Matawan Road. The hospital will accommodate about 2,000 patients; construction will be undertaken about July 1, when an appropriation of $1,200,000 becomes available.

Society News.—The Bergen County Medical Society was addressed, recently, by Dr. Wilfred M. Barton, Georgetown University School of Medicine, Washington, D. C., on "Drugs." ——Dr. William Martin, Atlantic City, addressed the Camden County Medical Society, recently, on "Electrotherapy."——The Essex County Medical Society, Newark, was addressed, November 8, by Dr. Frederick W. Rice, New York, on "Maternal Welfare."——Dr. Benjamin F. Buzby, Camden, addressed the Gloucester County Medical Society, November 15, on "Importance of Early Recognition of Orthopedic Conditions."——The Hudson county bar and county medical societies met jointly, November 7, in Jersey City; Mr. H. H. Corbin read a paper on "The Jury on Trial," and Dr. Otto H. Schultze, New York, on "The Practice of Legal Medicine."——The Passaic County Medical Society, Paterson, was addressed, November 8, by J. Vincent Barnitt on "Relation of the Physician to the Prosecutor's Office."

NEW YORK

Olean Sued—Health Officer Appointed.—The adminstrator of an estate has filed suit to recover $5,000 damages as a result of the death from typhoid of a Buffalo resident, who is alleged to have contracted the disease by drinking water in Olean during the period that the water was polluted. Following the resignations of the water commissioners and health officer of the city of Olean, the mayor appointed N. E. Phillips, Dr. E. D. Kilmer and E. H. Atwood as water commissioners, and Dr. J. A. Johnson as health officer, and they were unanimously confirmed by the council. Dr. Johnson was health officer of the city previously from 1916 to 1922.

Society News.—Dr. Louis H. Clerf, Philadelphia, addressed the Onondaga County Medical Society, December 11, on "Peroral Endoscopy in Modern Medicine," illustrated with lantern slides.——The state health department has secured another health film called "Drinking Health," showing how essential a supply of good water is to health. Application for its use should be made to the supervisor of exhibits, state department of health, 4 Clinton Avenue, Albany.——There were 120 communities in the state outside of New York City, December 5, in which certifications of the existence of rabies were still in force. Another human death from rabies in Westchester County occurred in November. For the first eleven months of 1928, there were fifty-five rabid dogs reported from Westchester County.——St. John's Riverside Hospital, Yonkers, is conducting a campaign to raise $750,000 for improvements.

New York City

Fourth Harvey Lecture.—Dr. William de B. MacNider, Kenan research professor of pharmacology, University of North Carolina School of Medicine, Chapel Hill, will deliver the fourth Harvey Society lecture at the New York Academy of Medicine, January 17, on "Urine Formation as Illustrated by an Experimental Nephritis."

Dr. Schroeder Heads Department of Hospitals.—Dr. William Schroeder, Jr., Brooklyn, has been appointed head of the department of hospitals, recently created to manage the twenty-six hospitals of the city which have been under the jurisdiction of the health department and of the public welfare department. Dr. Schroeder has been in practice in Brooklyn about twenty-five years; he is now chief surgeon at the Harbor Hospital and attending surgeon at the Cumberland and Prospect Heights hospitals, and a consultant at the Brooklyn Cancer Institute. He served in France in the World War and is lieutenant colonel in the National Guard. Dr. Schroeder will take up his new duties, February 1.

Study of Influenza.—The Metropolitan Life Insurance Company has appropriated $10,000 for a study of the cause and transmission of influenza and the methods of prevention, according to an announcement by Dr. Milton J. Rosenau, Harvard University Medical School, chairman of the company's influenza commission. Dr. Rosenau pointed out that this is the first opportunity the commission has had since 1919 to make an extensive investigation along the lines for which it was originally formed. Other members of the commission are Edwin O. Jordan, Ph.D., University of Chicago; Dr. George W. McCoy, director, Hygienic Laboratory, U. S. Public Health Service; Dr. Wade H. Frost, Johns Hopkins University, Baltimore; Dr. William H. Park, New York University, and Dr. Augustus S. Knight and Lee K. Frankel, Ph.D., of the Metropolitan Life Insurance Company.

Society News.—The Association for Research in Nervous and Mental Diseases held its ninth annual meeting, December 27, at the Hotel Commodore, under the presidency of Dr. Walter Timme; papers were read by physicians from medical centers throughout the country and in Canada.—— Dr. Charles A. Spivacke has been elected president of the Physicians League for the ensuing year.——Dr. Joseph L. Tenenbaum has been made president of the American Hebrew-Speaking Medical Association for 1929.——Dr. Zachary Sagal has been elected president of the Central Medical Society for the ensuing year and Dr. Hyman Robert Landon, secretary. ——The American Social Hygiene Association will hold its annual meeting at the Hotel Pennsylvania, January 18-19. An informal conference will be held at 2:30 p. m., the first day for the discussion of papers on social hygiene. A guest of the association and of the Canadian Social Hygiene Council will be Col. L. W. Harrison of the ministry of health of Great Britain, who will speak on "Medical Advances in the Social Hygiene Field."——At the annual meeting of the New York Academy of Medicine, January 3, the retiring president, Dr. Samuel W. Lambert, spoke on "The Academy as an Edu-

cational Center," and the incoming president, Dr. John A. Hartwell, on "The Academy, the Profession and the Public." Dr. Reginald Burbank gave an address on study of the streptococcus in the etiology of arthritis. The section of pediatrics will be addressed, January 10, by Dr. McKim Marriott, St. Louis, on the clinical aspects of the rôle of focal infections in producing gastro-intestinal symptoms in infants and children, and by Dr. A. F. Hartmann, St. Louis, on the chemical changes in the body with reference to the same general subject. Dr. Harry P. Cahill, Boston, will address a joint meeting of the section of otology and the section of neurology and psychiatry, January 11, on "Treatment of Otologic Brain Abscess"; Dr. Foster Kennedy will read a paper on "Diagnosis of Brain Abscess," and Dr. Joseph E. J. King, "The Neurosurgical Treatment of Brain Abscess." The section of historical and cultural medicine will be addressed, January 11, by Dr. Fred B. Lund, Boston, on "Medicine and the Study of the Classics," and by Dr. Charles N. B. Camac on the papyrus industry, with some remarks on the Edwin Smith papyrus.

OHIO

A Father at Seventy.—Following a special investigation, the state department of health reports that its record age of parents was made last year when a child was born to parents in Coshocton County whose combined ages were 121 years. At the time of the child's birth, the father had passed 71, and the mother had passed 51. The father is a farmer and a former school teacher.

Society News.—Drs. James R. and William T. Moore, New Concord, addressed the annual dinner meeting of the Muskingum County Academy of Medicine, Zanesville, December 5, on "Diseases Peculiar to the Land of Hot Sands." The Drs. Moore formerly practiced in Egypt; one of them has just returned to this country on furlough.——Dr. Oscar P. Klotz has been elected president of the Kiwanis Club of Findlay.——Dr. Thomas A. Ratliff has been reelected president of the Cincinnati Public Health Federation, Dr. Julien E. Benjamin, vice president, and Dr. Arthur C. Bachmeyer, honorary secretary.——Dr. J. Forrest Stultz, Urbana, has resigned as health commissioner of Champaign County after four years' service.

New Unit in Medical Center.—With the dedication, December 4, of the Rainbow Hospital for crippled and convalescent children, another unit was added to the medical center at Western Reserve University School of Medicine, Cleveland. This is the only unit which is not on the university campus; it is well outside of the city on Green Road. The 125 beds of Rainbow Hospital are divided between orthopedic and pediatric work in the ratio of two to one. It was financed by funds subscribed to the university campaign conducted nearly two years ago and cost $460,000. It is fireproof, 500 feet long, and built on a single floor, with porches on all sides. The staff includes Drs. Henry J. Gerstenberger, Elliott C. Cutler, William M. Champion and Maxwell Harbin.

RHODE ISLAND

Society News.—At the quarterly meeting of the Rhode Island Medical Society, Providence, December 6, Dr. Harvey B. Sanborn, Providence, read a paper on "Neurologic Contacts with Other Fields of Medicine," and Dr. Charles A. McDonald, Providence, on "Personality Make-Up of the Individual in Sickness."

Survey of Mental Patients.—First admissions to the Rhode Island State Hospital for Mental Disease during 1927, according to the U. S. Department of Commerce, totaled 376, as compared with 391 the preceding year. The number of mental patients under treatment in the hospital has increased steadily from 1,101 on Jan. 1, 1910, to 1,762 on Jan. 1, 1928. The increase in the number of first admissions, however, between 1922 and 1927, was relatively smaller than the growth in the state's population during that period, as shown by the fact that the first admissions in 1927 numbered 53.4 per hundred thousand of population as compared with 54.1 in 1922. Of the patients present, Jan. 1, 1928, 906 were males and 856 females. The figures for 1927 and 1928 are preliminary and subject to correction.

TENNESSEE

Society News.—Dr. Philip M. Lewis addressed the Memphis and Shelby County Medical Society, November 6, on "Gonorrheal Ophthalmia," and Dr. Roswell E. Flack on "Collapse Therapy in Pulmonary Tuberculosis"; the November 20 meeting of the society was addressed, among others, by Dr. John L. McGehee, Jr., on "Application of the Mikovlicz Principle in Treatment of Sigmoidal Fistula," illustrated with lantern slides.——At a meeting at the Rutherford Hospital, Murfreesboro, December 5-6, clinics were conducted by Drs. Willis C. Campbell, Memphis, and Barney Brooks, Nashville. Addresses were made by Dr. Waller S. Leathers, dean, Vanderbilt University Medical School, Nashville, on "The Hospital in Relation to the Community"; by Dr. Kirby S. Howlett, Franklin, on "Present Day Trends in Medicine"; by Dr. Brooks on "Diagnosis and Treatment of Acute Intra-Abdominal Conditions" and "Early Diagnosis of Cancer," and by Dr. Campbell on "Fractures of the Femur," illustrated with moving pictures, and "Fractures Above the Elbow." The hospital was host to the physicians at a dinner.——The Madison County Medical Society, Jackson, was addressed, November 20, by Dr. William W. Grant on "Improved Technic in the Operation for Anterior Colporrhaphy for Cystocele and the Watkins Interposition Operation for Prolapsus of the Uterus," and by Dr. Jefferson D. Hopper on "Feeding of Typhoid Patients."——The Washington County Medical Society met at the National Soldiers' Home. recently; Dr. Warren M. Royal read a paper on "Aortic Insufficiency," and Dr. W. F. Willien on "Brain Tumor."——The physicians of Marysville since October 30 have been giving medical talks to the high school pupils; among the subjects discussed are backyard sanitation, sickroom sanitation, first aid to the injured, tuberculosis, posture and breathing, care of the nose and throat, diet and eating, clothing, collection and disposal of garbage, and contagious diseases.

TEXAS

Tuberculosis Conference.—The second annual meeting of the Southwestern Tuberculosis Conference will be at the Texas Hotel, Fort Worth, Jan. 22-23, 1929, for the purpose of assembling persons interested in the eradication of tuberculosis. Physicians, veterinarians, nurses and public health and welfare workers generally are invited. There will be speakers of national reputation, and pathologic and other exhibits. The secretary is T. O. Booth, Fort Worth.

GENERAL

California, New Hampshire and Vermont Had Highest 1927 Death Rate.—In announcing mortality figures for the registration area of the United States in 1927, the department of commerce states that the highest rate by states (13.9) was for California, New Hampshire and Vermont, and the lowest (7.1), for Idaho. The mortality rate for the whole registration area in 1927 was 11.4, as compared with 12.2 in 1926.

News of Epidemics.—An outbreak of about twenty cases of typhoid was reported in November in Weeksbury, Ky.——About twenty cases of smallpox were reported at McArthur, the capital of Vinton County, Ohio, December 2.——Twenty-one patients with smallpox were under quarantine at Suffield and Randolph, Portage County, Ind., December 11, bringing the total number of cases of smallpox in the county since October 1 to forty-seven.——Five new cases of smallpox were reported at Irwin near Kankakee, Ill., December 11; there were then said to be forty cases in Pekin, Ill.

Labor's Campaign to Prevent Blindness.—The American Federation of Labor and the National Society for the Prevention of Blindness will join in a campaign for the prevention of blindness among industrial workers. The announcement says that industry in this country is paying about $10,000,000 a year compensation to workmen who have been blinded while at work, while the loss to the workmen themselves through blindness or impaired vision is probably much more than that. The campaign will be educational, carried on through publications of the American Federation of Labor and local organizations, by radio, and by exhibits in meeting places of labor organizations. The National Society for the Prevention of Blindness, 370 Seventh Avenue, New York, has for about twenty-seven years been engaged in educational work for the conservation of vision.

Influenza Is Wide-Spread.—For the week ending December 22, there were reported to the U. S. Public Health Service from forty-five states 252,016 cases of influenza, as compared with 141,000 for the previous week. As the public health service estimates that only one fifth of the actual number of cases were reported, the total estimated number of cases for the week would be 1,260,000. There were 710 deaths from influenza reported for the week by fifty-eight cities, as compared with 475 deaths for the previous week from sixty-two cities. The death rate, thus far, indicates that the disease has been of an unusually benign type as far as mortality is concerned. Surgeon General Cumming stated that more than 500,000 deaths were reported in the 1918 epidemic, about 100,000 in the 1920 epidemic, and about 18,000 deaths in 1926. He believes that the present epidemic is serious in view of its

extent, although there is no cause for alarm. Evidence available at present indicates that the deaths resulting from the present epidemic will be more numerous than those of 1926.

Study of Effects of Moving Pictures on Children.—The child welfare committee of the League of Nations is studying the effects of moving pictures on children. It recommends that the attention of every country be drawn to the advisability, from the point of view of the moral and physical welfare of the young, of showing films in diffused light and in daylight. The council of the League of Nations requested the secretary to call to the attention of all governments the recommendations of the child welfare committee, which, at its next session, will be requested to consider the possibility of establishing supervision over posters and other forms of publicity for moving picture performances. The council has referred to the committee a scheme for setting up an international educational cinematographic institute at Rome. With regard to the gift of $5,000 to the committee by the American Social Hygiene Association, it was decided that it could be most usefully employed in studying the problem of children whose environment is bad or who are exposed to moral and social danger, attention being concentrated mainly on the possibilities of prevention.

International Surgical Congress.—The eighth congress of the International Surgical Society will be held in Warsaw, Poland, July 23-26, under the chairmanship of Professor Hartmann. Although the number of members will not be much increased (it is now 970), it is desirable that twenty-five new members be appointed from the United States, and requests for admission to the congress may be made to the general secretary, Dr. Leopold Mayer, 72, rue de la Loi, Brussels. The provisional list of subjects and speakers appointed by the international committee includes among others: "Causes and Mechanism of Postoperative Embolism" by Drs. Chiasserini, Rome; P. Govaerts, Brussels; Matas, New Orleans, and Ritter, Zurich; "Results of Resection of the Stomach in Gastric and Duodenal Ulcer" by Drs. Bartrina, Puiy y Súreda and Ribas y Ribas, Barcelona; Borghi, Baldo Rossi and Scalone, Milan; Clairmont, Zurich; Lardennois, Paris, and Schoemaker, Scheveningen; "Treatment of Exophthalmic Goiter" by Drs. Crile, Cleveland; Jirasek, Prague, and Loicq, Brussels, and "Reparative Surgery of the Hip" by Dr. Mathieu, Paris. If there is sufficient demand, a special boat will leave Antwerp, calling at certain ports en route to Warsaw.

Society News.—The twelfth exposition of Chemical Industries will be held at the Grand Central Palace, New York, May 6-11.——At the recent annual meeting of the Central States Pediatric Society in Pittsburgh, Dr. J. Gurney Taylor, Milwaukee, was elected president for the ensuing year, and Dr. Arthur H. Parmelee, Chicago, secretary.——The Fifth International Botanical Congress will be held at Cambridge, England, August 16-23, 1930. Membership in the congress will cost £1, which should be paid to the treasurer, Dr. A. Rendle, British Museum, London, S. W. 7.——Dr. Ludvig Hektoen, Chicago, was elected president of the Society of American Bacteriologists at the annual meeting in Richmond, Va., December 28; Dr. Stanhope Bayne-Jones, vice president, and James M. Sherman, Ph.D., Ithaca, N. Y., secretary, reelected.——H. A. B. Dunning, Baltimore, has been elected president of the American Pharmaceutical Association and together with other newly elected officers will be installed at the annual meeting in Rapid City, S. D., August 26-31.——The International Congress of Psychology, which will meet at Yale University School of Medicine, New Haven, Conn., September 1-7, will be divided into fifteen divisions; English, French, German and Italian will be the official languages. The chairman of the program committee is Prof. Raymond Dodge, Ph.D., of Yale.

Effect of Drivers' License Laws.—States in which the law requires an examination and license of motor drivers are Massachusetts, Connecticut, New York, Pennsylvania, New Jersey, Maryland, California, Maine, Vermont, New Hampshire and Rhode Island. A study of the effect of these laws has been made by the National Safety Council, whose director of the public safety division, Sidney J. Williams, has published some results. The National Safety Council, it appears, has developed a method of calculating the effect of these laws which would eliminate certain variables, thus giving a more accurate reflection of the effect of enforcing license laws. The conclusion drawn is that a drivers' license law, with examination of new drivers, properly administered by a licensed department, may be expected to reduce motor fatalities by about 20 per cent. A few states have drivers' license laws which do not require examination of new drivers and which are not administered by a centralized state bureau; this study does not indicate that such laws have reduced accidents. Mr. Williams believes that the results of this study are conclusive evidence of the value of a license law with examination and proper administration and of the need of enacting such a law in every state in the Union. The states not having a license law suffered a total of 17,000 motor vehicle fatalities; he says that if each of these states would enact laws such as have been indicated, within a few years, there would be a saving of more than 3,000 lives a year.

International Study of Rickets.—At the July conference in London of experts on infant welfare, it was decided to submit to the health committee of the League of Nations a proposal concerning the international inquiry on rickets, the object of which is to determine the etiology and to reach conclusions concerning the prophylaxis. The conference was of the opinion that the health organization of the League of Nations was the proper body to undertake this work, and that it should be conducted by children's specialists with the assistance of physiologists and experts in biochemistry and physics. The conference believed that it would enhance the value of the study if the same tests were adopted in the different countries and if the study could be unified. A number of districts, chiefly urban, might be selected as research areas, in each of which all children would be examined from birth up to 2 years of age. For this feature, districts might be chosen in which about 100,000 children were born each year; each child would be examined five times; for example, at 3, 6, 12, 18 and 24 months of age. This examination should be clinical; in some cases radiologic and chemical tests should be made. At the same time inquiries should be conducted into such factors as climate, housing, diet and the child's mode of living. Some of these tests, the conference proposed, would be made by a physicist—for example, tests regarding the luminosity of ultraviolet rays in the region concerned—or by physiologists with regard to the food values and diet.

The conference concluded from the results of the inquiry on infant deaths in selected districts in a twelve month period that three causes account for the largest proportion of infant deaths in all countries: (1) stillbirths and premature births; (2) respiratory diseases, and (3) gastro-intestinal diseases. The importance of these three causes was constant in all countries, although their relative importance differed in different countries. The cause of premature and stillbirths was discussed and the view expressed that these conditions might be due to the absence of adequate and prenatal obstetric care or to lack of supervision during pregnancy and undue obstetric intervention. The relatively large number of stillbirths and infant deaths for which it is impossible to give a specific cause requires further investigation in which the assistance of the pathologist is necessary. Another study in which the obstetrician and pediatrician should collaborate would be that of the causes of deaths occurring within a few hours after birth, and the part played by syphilis in the causation of stillbirths, premature births and precocious death. The conference believed also that the relation of the milk supply to infant mortality requires further study.

FOREIGN

Personal.—Dr. John P. Kinloch, head of the public health department of Aberdeen University, has been appointed chief medical officer in the department of health for Scotland; on January 1, he took over the duties of the Scottish Board of Health.——Dr. John McGibbon, formerly of the University of Witwatersrand, Johannesburg, South Africa, was installed, November 9, as professor of midwifery and gynecology at the University of St. Andrews, Dundee, Scotland, succeeding Prof. John A. C. Kynoch.

Congress of Dermatologists and Syphilologists.—The fourth Congress of French-Speaking Dermatologists and Syphilologists will meet at the Hospital Saint-Louis, Paris, July 25-27, under the chairmanship of M. Sabouraud, Paris. The main topics on the program will be (1) polymorphous erythemas, by Drs. Lortat-Jacob, Paris, and Ramel, Lausanne; (2) the prurigos, by Favre and M. Civatte, and (3) malaria therapy in nervous cerebral syphilis, by Chevalier and Dujardin. The dues are $8 for nonmembers of the association. Information may be had from the general secretary, M. le docteur Clement Simon, 104, avenue Malakoff, Paris (XVI°).

A Malpighi Evening.—The Osler Club, December 7, celebrated the sixtieth birthday of its corresponding member for Austria, Dr. Max Neuburger, professor of the history of medicine, University of Vienna, by holding a "Malpighi evening." Dr. John D. Rolleston emphasized the wide range of subjects covered by Dr. Neuburger's work; messages were read from

the Austrian legation in London and from Professor Castiglioni, the corresponding member for Italy, and an opportunity was given to see Dr. Neuburger's most important writings. Sir William Osler, the foreign secretary stated, is said to have been responsible for the English publication of Neuburger's History of Medicine. Papers on Malpighi were read by Professor Clark and Dr. Fulton, illustrated by lantern slides and exhibits, and the Wellcome Historical Medical Museum lent its portrait of Malpighi for this meeting.

Wealth Dictates Teaching Policy.—A citizen has given to the University of Sydney, Australia, about $1,000,000 for the specific purpose of establishing three chairs in the medical school and of equipping the necessary laboratories. According to the *Medical Journal of Australia*, the new professors of medicine, surgery and bacteriology will be required to devote their whole time to their tasks, which will include research. Heretofore the chairs of medicine and surgery have been filled by part-time professors. The salaries of the new professors of medicine and surgery are understood to be £3,000. The editor of the foregoing journal looks on this philanthropy as providing a new system in the Medical School of the University of Sydney and as a great service to medical education. It might be stated that the system of full-time professorship in medicine and surgery has been tried in a few schools in the United States for some years. The experience seems to indicate that the system has not been altogether satisfactory.

Government Services

Captain Riggs Nominated Surgeon General of Navy

Captain Charles E. Riggs, in command of the naval hospital, Washington, D. C., was nominated, Dec. 26, 1928, by Secretary Wilbur to be surgeon general of the navy and chief of the bureau of medicine and surgery to succeed Rear Admiral Edward R. Stitt, who was transferred to the Pacific Coast to assume charge of the navy's medical activities in that part of the country. Captain Riggs was born in Iowa in 1869, was graduated from the State University of Iowa College of Medicine in 1892, and was commissioned in the navy, April 18, 1893. During the Spanish-American War, Captain Riggs served on the U. S. S. *Newport*. After duty aboard various ships and at naval hospitals, he was assigned to the Washington navy yard in 1916; in 1917, he was appointed fleet surgeon of the Asiatic Fleet. He was a member of the Naval Examining Board and Board of Medical Examiners at Washington from 1918 to 1921. When in command of the naval hospital at Newport, R. I., he received commendation for assisting in caring for victims of the S. S. *Mackinac*, which had a boiler explosion in 1925, resulting in the death and injury of many passengers. Captain Riggs utilized the facilities of the naval hospital in this emergency.

Change of Station in the Army

Capt. John D. Barnwell has been relieved from duty at Fitzsimons General Hospital, Denver, and assigned to the William Beaumont General Hospital for duty, El Paso, Texas, about February 1.——Capt. Irwin B. Smock has been transferred from duty at Fort Thomas, Kentucky, to Fort Ethan Allen, Vermont.——Major Francis H. Poole, commandant, school of aviation medicine, Brooks Field, Texas, is relieved from further additional duty as station and flight surgeon; Capt. Neely C. Mashburn, now on duty at the school of aviation medicine, will, in addition to present duties, report in person to the commanding officer, Brooks Field, for duty.——Col. Douglas F. Duval, who recently arrived from Hawaii, will, on expiration of leave of absence granted, proceed to Fort Monroe, Virginia, for duty.——Lieut. Col. August W. Spittler has been relieved from duty at Walter Reed General Hospital, Washington, D. C., and will sail from New York about February 21 for the Canal Zone for duty.——It is announced that Lieut. Col. Arthur S. Pendleton, having been found incapacitated for active service on account of disability incident thereto, is retired from active service.——Major Guthrie E. Scrutchfield, having been found by a retiring board incapacitated for active service on account of disability incident thereto and such finding having been approved by the President, has been retired from active service.——Capt. Carroll P. Price is relieved from duty at Chilkoot Barracks, Alaska, on completion of his present tour of foreign service and is assigned to Fort Lawton, Washington.

U. S. Public Health Service

Surg. Howard F. Smith on arrival of a relief officer will proceed from Bergen, Norway, to Palermo, Italy, for duty in the office of the American consul. P. A. Surg. W. Y. Hollingsworth on arrival of his successor at Palermo will proceed to Washington, D. C., for duty in the hygienic laboratory. Asst. Surg. L. R. White has been relieved from duty, Ellis Island, New York, and directed to proceed to Bergen, Norway, for duty in the American consulate. Asst. Surg. E. B. Archer on arrival of his successor will proceed from Hamburg, Germany, for Bremen, Germany, for duty at the American consulate.

Senior Surg. Taliaferro Clark has been relieved from duty at Paris, France, and directed to proceed to Washington, D. C., for duty. Surg. Walter L. Treadway has been relieved from duty at Dublin, Irish Free State, and assigned to duty at the U. S. Public Health Service Relief Station, Washington, D. C., Asst. Surg. William H. Gordon has been relieved from duty at El Paso, Texas, and assigned to duty at the U. S. Marine Hospital, Portland, Me. Surg. Vance B. Murray has been relieved from duty at Shanghai, China, and assigned to Washington, D. C., while Acting Asst. Surg. Thomas B. M. Dunn has been directed to report for duty at the American consulate at Shanghai.

Changes in Veterans' Bureau Personnel

The November U. S. Veterans' Bureau Medical Bulletin announces the following changes in personnel:

HOSPITALS

Dr. Rinaldo E. Baker, transferred to Palo Alto, Calif.
Dr. Grant B. Bushee, appointed at Northport, Long Island.
Dr. Luther M. Callaway, resigned at Kansas City, Mo.
Dr. Kelso A. Carroll, transferred to Tucson, Ariz.
Dr. Samuel K. Carson, resigned at Palo Alto, Calif.
Dr. Paul I. Carter, transferred to Portland, Ore.
Dr. Isaac A. Dix, transferred to Tacoma, Wash.
Dr. William C. Gibson, transferred to Tacoma, Wash.
Dr. David T. Kimbrough, appointed at Fort Lyon, Colo.
Dr. Harold F. Machlan, transferred to Atlanta, Ga.
Dr. Vernon L. Mahoney, resigned at Fort Snelling, Minnesota.
Dr. Lloyd H. Mott, appointed at Walla Walla, Wash.
Dr. Audley O. Sanders, transferred to Palo Alto, Calif.
Dr. James W. Thornton, transferred to Livermore, Calif.
Dr. Norbert C. Trauba, appointed at Boise, Idaho.
Dr. Tom V. Willis, appointed at Lake City, Fla.
Dr. Ernest L. Wilson, transferred to Seattle.

REGIONAL OFFICES

Dr. Don M. Hooks, resigned at Buffalo.
Dr. W. R. Angell, resigned at Hartford, Conn.
Dr. Robert N. Bowman, appointed at Pittsburgh.
Dr. Lyman A. Burnside, appointed at Charlotte, N. C.
Dr. Jesse J. Everett, transferred to Nashville, Tenn.
Dr. Walter A. German, resigned at Kansas City, Mo.
Dr. Joseph B. Knipe, resigned at New York.
Dr. Paul G. Sudhoff, appointed at Cincinnati.
Dr. Lewis R. Tryon, transferred to New York.
Dr. Joseph T. Woodward, appointed at Pittsburgh.

Report of Surgeon General of Navy (Continued)

There were nine admissions during the year for typhoid and six for paratyphoid, making the combined admission rate 13 per hundred thousand, as against a rate of 3.52 in 1926. There were three cases of rabies, all contracted in China, and this was the first time since 1916 that rabies occurred in the navy. Rear Admiral Stitt says there is a shortage of personnel. The special conditions which have contributed to bring it about are the increases in the number of veterans' bureau patients, cared for by the navy, and the demand on navy personnel to fill newly created "billets." Once men are allowed to be assigned to these new duties, they are rarely ever released, so that each such new detail represents a prominent reduction from the effective navy personnel. The number of such new "billets" created in the last two years amounted to sixty-one. Expeditionary forces have made a heavy drainage on personnel, fifty-five medical officers having served in China, Nicaragua and Haiti. Such details as have been enumerated reduced the number of available medical officers for more strictly naval duties from 813 (the appropriated number) to 594. During the year covered by this report, fifty-one new medical officers were commissioned, but in the same period forty-six were separated from the service, thirty-one by resignation, twelve by retirement and three by death. The present method of securing new material for the medical corps by offering internships to recent graduates has been primarily successful but the method operates to reduce materially the effective strength of the corps, in that these new officers are not available for detail to the current needs of the service. Admiral Stitt acknowledges indebtedness to other departments of the government and to individuals who have assisted in furthering the usefulness during the year of the medical department of the navy. (THE JOURNAL, Dec. 29, 1928, p. 2074.)

Foreign Letters

LONDON

(From Our Regular Correspondent)

Dec. 1, 1928.

Sex Education

The Edinburgh Education Authority has found the subject of sex education difficult to settle. The committee on religious and moral instruction suggested that some carefully guarded action be taken to stimulate parental responsibility in regard to sex education. It recommended (*a*) the holding of a special meeting (or meetings) once a year of parents of children over 12, and (*b*) the drawing up of a short list of pamphlets for the use of head masters, teachers and parents. It was moved further (*c*) that should any parent express a desire for such instruction to be given to his children, it should be done only by such teachers as are willing to do so, and, in the opinion of the head master, are qualified for the work, or by one of the medical staff, the instruction to be given in all cases by a person of the same sex as the child. No class instruction is to be given. In moving the adoption of the report the convener, Rev. William Ross, said that two extreme views were taken on the matter: that no education of the kind should be given in the schools, which would be the ideal thing if parents always did their duty, and that the education should be given as part of the curriculum. Prof. J. Y. Simpson moved the deletion of *c*, which he said expressed an ostrich-like attitude to a pressing problem and savored of the end of the last century. He intended to move the introduction of a course of biology in the secondary schools. Education in sex should come naturally out of that course. He said that all our troubles were due to lack of information and to the fact that we were not dealing with the question in the way that our time and generation demanded. However, his proposal was defeated and the committee's recommendations were adopted.

State-Aided Health Resorts

An appeal for the extension of the scope of the insurance acts to develop British health resorts was made by Dr. C. W. Buckley before the delegates to the annual meeting of the International Society of Medical Hydrology, at the University of London. Great Britain, said Dr. Buckley, had lagged far behind many continental countries and one of the dominions, New Zealand, in state direction or ownership of health resorts. British spas were, until a few years ago, ignored by the government, and regarded as the playground for the wealthy rather than as the sanatoriums of the nation, as they should be. The difficulty might be partly overcome by extension of the insurance benefits, but a perfect scheme demanded that the advantages of spa treatment should be brought within the reach of the great number who were not insured or eligible for insurance under existing conditions. Dr. Buckley urged the state organization and subsidization of certain small space and health resorts, whose resources were not adequately developed, so that they might be made available, particularly for those who required assistance to enable them to undergo treatment. Spa hospitals should be utilized and further developed, especially for the more serious cases. In all spas clinics should be established, organized by the medical profession or the municipality, the patients to pay a sum adequate to meet the expenses incurred and to be housed in hostels or private lodgings. The cost of this would be met entirely or in part by the insurance funds.

A Use for Condemned Murderers

In an address at a cancer campaign meeting, Dr. F. G. Norbury, surgeon to the Chester Infirmary, said that investigators of cancer were greatly hampered by being confined to experiments on the lower animals. A rat could not be inoculated with mouse cancer, or vice versa. It was more difficult to propagate from a white Leghorn fowl to a Rhode Island red than to another white Leghorn. These differences showed that experiments on the lower animals were unreliable when applied to such a different species as man. The investigator was not studying the form of the disease he wanted to study. Experiments should be performed on man. An individual who had been sentenced to death should be allowed, if willing, to give up his body for experiment. The likelihood of death and still more of great suffering should be explained to him. If he elected to take the risk and save his neck, the first object of the investigator would be to produce cancer in him. If he lived for five years he might then be released, especially if he was cured. He would then have made some reparation for the injury he had done to society. If he died, his life would have been prolonged beyond the time the law allowed him had he been hanged, and he might even then have furnished important additions to our medical knowledge. "We waste a great deal of material every year by hanging people."

An Unrecognized Pioneer of Anesthetics

At the annual dinner of the Royal Society of Medicine, the president, Lord Dawson of Penn (physician to the London Hospital), referred to an interesting discovery by Mr. Thompson, curator of the Historical Medical Museum. Mr. Thompson had shown that in 1825, preceding the introduction in 1842 of ether in the United States and in 1847 of chloroform in Scotland, a young physician named Hickman produced anesthesia by inhalation of carbon dioxide and nitrous oxide in animals, performed painless operations on them, brought his results to the notice of the English and French professions, and tried in vain to persuade them to institute the same anesthesia for man.

Research in Relation to Public Health

At the Public Health Congress and Exhibition, Sir Walter M. Fletcher, secretary of the Medical Research Council, gave an address on the relation of research to public health. He referred to the important results achieved by the science of bacteriology in the development of the public health service. Had bacteriology, he asked, been sufficiently applied? Experience with the milk supply for thirty years had shown how the great boon that bacteriology had to offer through providing a clean milk supply had been hampered. It had been known for a long period that a high percentage of the milk drunk contained tubercle bacilli, and this condition was only imperfectly corrected at present. What that had meant to British people and to people in other countries was past dispute. Hunchbacks and cripples might be seen in the streets, but they represented only a fraction of the suffering due to that single type of contamination. If the public could have realized the full extent of the evil it would long ago have made the condition a great and leading political issue.

INDUSTRIAL PHYSIOLOGY

While public health had been developed, the industrial revolution had brought great populations from the country into the cities and provided problems of physiology. Men and women and also children were brought into contact with machinery and were exposed to a great variety of new conditions of stress and strain. It was strange that English people, who had been so interested in the use and proper care of dead machinery, had shown ignorance and apathy in the wasteful use of human machinery. He then referred to the steps taken since the war in the application of the science of industrial physiology to labor. One of the most interesting, and almost amusing, applications of physiology to public health, however unconscious, had been the voluntary action of women. From motives he would not attempt to analyze—whether the result of a feminist movement or of fashion—they had applied practical physiology

most noticeably in their dress and had produced an astonishing revolution in health in consequence. Whether due to the shorter skirt, the lower neck, or customs of exercise, it was incontestable that a revolution in the health of women had happened. Twenty years ago anemia was common among girls, causing them to have green faces. But chlorosis had now gone.

Referring to nutrition and diet, Sir Walter Fletcher said that the change from rural to city life meant a change in the diet of the people. With improved means of transport, food had been coming from greater distances and had been subject to a greater variety of operations in collection and distribution. That had brought many benefits and many evils. The benefits were plain. City populations had a greater variety and cheaper food; but there had been at the same time a dangerous loss of essential food values which were not to be detected by the ordinary person. This question was of overwhelming importance. On the teaching of modern science, if they had to choose between housing reform and dietary reform, dietary reform ought to have the precedence. Science was calling out for the application of a constructive policy of definite nutritional guidance and not only nutritional prohibition. In this direction there was the greatest hope of remedying the disquieting condition of the national physique. Was the national physique becoming better? If any one could walk through the crowded industrial cities and see the workers coming from their work, or see a crowd at a football match, and not have a sinking at the heart at the stunted figures, poor physique and bad teeth, he had no eyes to see. They were not a native standard characteristic of the country. There was no racial stock more capable of producing the finest examples of stature, health and beauty. Recent research showed that it was not housing or external environment that was accounting for the failure in physique, but the internal effects of food—not deficiency in quantity but deficiency in the right qualities. It was more correct, perhaps, to say that men of bad physique made slums than to say that slums made men of bad physique. The knowledge that we possessed indicated that we had the means of restoring to the great mass of our people their birthright of stature, health and beauty.

Marked Decrease in Emigration

The official figures of passenger movements from and to the United Kingdom in the first nine months of this year record a marked decrease in emigration as compared with the corresponding periods of 1927 and 1926. British subjects who left to take up permanent residence in non-European countries numbered 108,663, as compared with 119,862 in the first nine months of 1927. The number of British emigrants to the British empire during the first nine months of this year, as compared with the first nine months of last year, shows a decrease of 8,664. A decrease of 14,038 recorded in the first half of the year, was partially offset by an increase of 5,374 in the September quarter, which was entirely due to the departure of 8,449 harvesters for Canada. The number emigrating to British North America shows an increase of 1,668 in the nine months and of 7,916 in the September quarter, while during the nine months decreases of 8,024 and 2,294 were recorded in the numbers to Australia and New Zealand, respectively. If the British emigration to Australia and New Zealand during the twelve months ended September, 1928, is compared with that for the preceding year, a reduction of 7,000 is shown in the movement to Australia, while that to New Zealand has been halved, being 5,547 as against 10,883.

EMIGRANTS TO UNITED STATES

Emigrants of British nationality to the United States numbered 22,819 during the twelve months ended September, 1928, as compared with 26,340 during the corresponding period of 1926-1927; the British quota for each of the years ended June, 1927, and 1928 (Great Britain and Northern Ireland only), was 34,007. There was an increase of 278 in the number of British emigrants to other foreign countries during the first nine months of 1928.

PARIS

(From Our Regular Correspondent)

Oct. 31, 1928.

The Congress of Orthopedics

The tenth congress of the Société française d'orthopédie was held recently under the chairmanship of Professor Nové-Josserand of Lyons, at the Faculté de médecine de Paris. Many French and foreign conventionists took part in the discussion of the papers of Drs. Le Fort of Lille and Altenbach of Strasbourg on sudden luxations of the hip and on treatment of valgus flatfoot, respectively. The next congress will be held in Paris, Oct. 11, 1929, under the chairmanship of Dr. Albert Mouchet of Paris. The chief topics on the program are: "Para-Articular Tuberculosis of the Bone" and "Recurring Luxations of the Shoulder."

Death of M. Pierre Masson

The death of M. Pierre Masson, manager of the largest medical publishing house of Paris, from influenza, at the age of 64, has been announced. Pierre Masson succeeded his father in the management of this large publishing house, which has published almost all the important medical works that have appeared in France during the past fifty years. He was also the publisher of the *Presse médicale*, which is the most important French medical journal at the present time.

Program of the Next Congress of Stomatology

The committee on organization of the Congrès de stomatologie, the next meeting of which will be held in Paris, Oct. 22-29, 1929, has chosen Dr. Rousseau-Decelle as president and has selected the following questions as the main topics for discussion: (1) the septicemias of buccodental origin, to be presented by MM. Thibaut and Raison, and (2) surgical treatment of infections of the periapical region, curettage and resection; remote results, with introductory paper by M. Lacronique. The problem of prophylaxis of dental caries will likewise be discussed.

Dedication of the Foyer International des Etudiantes

The Foyer international des étudiantes was dedicated recently at ceremonies presided over by M. Cavalier, director of higher instruction, who represented the minister of public instruction, who, on account of illness, was prevented from attending. Madame Whitney-Hoff, who donated the site, was accompanied by Mlle. Watson, director of the foyer, and by members of the Fédération française des associations chrétiennes d'étudiantes, through the efforts and gifts of which the enterprise became possible. The building is located at 93, Boulevard St. Michel, diagonally opposite the Parc du Luxembourg. A vast hall or entry, decorated with green marble, leads to the assembly room, which is contiguous to the dining room. The various installations or arrangements of the foyer are conceived in a manner to assure the maximum of comfort without making the upkeep too expensive. In the subbasement and the basement, both of vast dimensions, are installed the heating apparatus, the coal bins, the transformers, the incinerators, the general storerooms, a model kitchen, and the hydrotherapeutic equipment. On the main floor, next to the assembly room, is a large cafeteria, in which from 400 to 500 persons may be served. On the mezzanine floor are the administration offices and seven large *salons* for the use of the women students. The upper stories contain 100 rooms, some with two beds, thus assuring a total of 120 beds. There are several bathrooms on each of these floors. In addition, there are the infirmary, the rest room, the library, the terraces where tea is served, and a solarium.

The foyer will accommodate a hundred or more boarders, while many other students will be able to belong to the club and profit by the advantages offered them: study halls, recreation and rest rooms, and medical care. The representative of the minister inspected carefully all features of the institution, whereupon he congratulated the organizers on the success of their undertaking. Madame Whitney-Hoff thanked the French government for its support of the enterprise, also the many individuals who had lent their aid, and closed her speech with a eulogy of "those persons who devote their whole lives to the service of humanity."

The Transformation of Unoccupied Military Establishments Into Asylums and Homes for the Aged

At present, owing to changes in the military service, many military establishments are no longer needed, while psychopathic hospitals and homes for the aged in the Paris region are becoming increasingly inadequate. M. François Latour, financial secretary of the city of Paris, has recently inquired of the prefect of the Seine whether he did not think that it would be advisable to consider the transformation into asylums and homes for the aged of such military establishments as would best meet the requirements. The experiment might well be tried. The partial evacuation of overcrowded establishments in the Paris region would make it possible to reduce the burden of hospitalization expenditures.

The Crusade Against Cancer in Alsace

A postgraduate course (theory and practice) in cancer and its treatment was given in October at the Anticancer Center of Strasbourg under the direction of Dr. Gunsett, with the collaboration of several professors of the Faculté de médecine and of the Faculté des sciences. The course, which was a great success, closed, October 30, after two days of public lectures and communications on cancer, under the chairmanship of M. Paul Strauss, senator and formerly minister of public health.

The Practice of Medicine in France by Foreigners

A decree, which was published in the *Journal Officiel*, Sept. 1, 1928, accords greater facilities for the conversion of a university diploma into a state diploma (*diplôme d'état*). The difference between the two forms of diploma is of great practical importance, since only the *diplôme d'état* confers the right to practice medicine in France. But the *diplôme d'état* can be obtained only by taking the same examinations which Frenchmen take on completing their courses in schools of secondary instruction and which lead up to the diploma termed "baccalaureate." Most students of foreign origin are unable to pass such a test, which presupposes the completion of courses of study in the French *lycées*. That is why the *diplôme d'université*, with easier courses of study, was created for their benefit, as it permits such foreign students to follow the courses of instruction in the French faculties of medicine and to receive recognition therefor, though the diploma does not entitle the holder to practice medicine in France. But many foreigners who hold the *diplôme d'université* seek, through the intervention of their ambassador, to have it transformed into a *diplôme d'état*. The medical societies have always energetically opposed such intervention, for the reason that the privileges accorded by the *diplôme d'état* must be obtained by the same studies—not merely medical studies but also the preparatory or secondary studies—when foreigners are involved as when Frenchmen are concerned. In fact, such concessions have rarely been granted by the minister of public instruction, although he has the legal power to do so. During the war, such concessions were more readily accorded to foreign physicians who had come to lend their aid in the hospitals. The new decree will make the securing of such concessions much easier. The subject is causing great agitation among the medical syndicates, and they are protesting vigorously against the measure, asserting that there are already more physicians in France, in proportion to the population, than can make a living from their profession, and that it is therefore inopportune to increase their number by favoring foreigners and relieving them of studies and tests that are imposed on Frenchmen. Furthermore, experience has shown that the majority of the foreign physicians open offices in the large urban centers in which there is already a plethora of physicians and where they hope to build up a clientele among the rich, foreign population.

In Honor of Prof. Victor Pauchet

The confrères, friends and collaborators of Prof. Victor Pauchet gathered recently at the Hôpital St. Michel for the purpose of presenting to him, on the occasion of his elevation to the rank of commander of the Legion of Honor, a medallion portrait of himself, the work of Hérain, who is both sculptor and physician. M. Calmette, assistant director of the Institut Pasteur, was to have presided at the ceremonies, but he was detained at a meeting of the health commission of the League of Nations. Short talks were given by Drs. Récamier, Tuffier, Peugniez (honorary director of the Ecole de médecine d'Amiens) Dartigues, Dominguez (Cuba) and Blanc. Dr. Pauchet, in grateful recognition, thanked the organizers of the fête and the many distinguished guests who had attended.

The Campaign Against Tuberculosis in the Postal and Telegraph Service

The Conseil supérieur d'hygiène des postes et télégraphes, created by a recent order, met yesterday for the first time under the chairmanship of M. Henri Chéron. The minister of the department expressed the desire that all new postoffices to be opened in the future shall be so equipped as to guarantee protection to the health of the personnel. The existing offices must be improved. M. Chéron emphasized the need of organizing the protection of the personnel against tuberculosis and spoke also on the problem of providing adequate housing facilities for the employees of the post, telegraph and telephone service. In the principal centers, the "foyer du postier" is utilized for the collective lodging of employees not otherwise provided for. In a general way, home ownership is promoted through the aid of the Crédit immobilier in the case of employees who are permanently located. With regard to the women employees, some of whom are mothers with families, M. Chéron thinks that day nurseries should be created. Before adjourning, the council passed a resolution to the effect that the law of June 30, 1923, pertaining to long leaves of absence, needed modification. The law is applied, at the present time, in cases of "open tuberculosis," but only when it is too late to cure the patient. Furthermore, it was held that the law should provide also the necessary treatment.

The Reorganization of Paris Hospitals

M. Loucheur, minister of labor and health, in agreement with M. Mourier, general director of the Assistance publique in Paris, has announced a number of additional hospitals for Paris, the construction of which will be begun at once. These institutions, which will necessitate the purchase of six areas of from 15 to 20 hectares, will be erected in the immediate suburbs of Paris. Four hospitals of 1,500 beds each will be built at once. The first cost, which will amount to 250,000,000 francs (nearly $10,000,000), will be covered, in part, by government participation and by the raising of 100,000,000 francs by subscription. Of the remainder, the city of Paris will furnish 100,000,000 francs and the department of the Seine, 50,000,000 francs. The construction of the four hospitals provided for in the preliminary program will require about eighteen months.

AUSTRALIA

(From Our Regular Correspondent)

Oct. 25, 1928.

Proposed National Insurance Legislation

A proposal to introduce compulsory insurance against the financial stress of sickness and disablement was submitted to the parliament of the commonwealth of Australia, September 14. National insurance has been contemplated for the last six or seven years. In 1923 a royal commission was appointed to investigate the subject and to recommend to the federal government a scheme best suited to Australian conditions. The commission presented its report in 1925. The parliamentary bill is now being brought forward only for national consideration. The term of the present parliament has expired and the bill cannot become law until next year, subsequent to the federal elections.

SCOPE OF THE PROPOSED LEGISLATION

The bill provides for insurance against sickness, disablement, widowhood, orphanhood and superannuation. Maternity allowance payment is not included in the scheme. Physicians are not directly affected by the proposed legislation, as medical benefit is not included. Their only relationship to the bill will be that they will be remunerated by the insurance board to certify to the cause of an injured person's incapacity. At some future date it is thought that medical benefit may be included in the scheme. The compulsory clauses of the bill apply to all workers employed under a contract of service, written or oral, express or implied. One of the important exceptions applies to persons who are not engaged in manual labor and who have a total income exceeding £416. Another important exception from compulsion is that of any employment in which it is proved that the terms are such as to secure provision in respect of sickness and disablement (extended sickness) not less favorable on the whole than the corresponding benefits under the act. A voluntary contributor is a person who is not employed within the meaning of the act but who is engaged in some regular employment on which he is wholly or mainly dependent, and whose total income in the preceding twelve months did not exceed £416. It is estimated that the total number of contributors to the scheme would be 1,600,000, comprising 1,240,000 males and 360,000 females. Actuarial authorities state that the scheme is sound.

BENEFITS PROVIDED BY THE SCHEME

Sickness allowance of £1 7s. 6d. a week is payable to male adults, £1 a week to female adults, and 15 shillings a week to minors unless married. After twenty-six weeks the maximum allowance is reduced to £1 a week. An extra sum of 5 shillings a week is payable during sickness in respect of each child under 16 years if supported by the insured person. In the event of death the widow would receive £1 a week for at least three years. An orphan would receive 5 shillings a week until he reaches the age of 16 years. A superannuation allowance of £1 weekly is payable at the age of 65 (males) and 60 (females), provided that the insured person has resided in Australia for at least twenty years. The wife or widow of a pensioner, when she attains the age of 60 years, receives a pension of £1 a week.

CONTRIBUTIONS AND FINANCE

In the case of an insured person who comes under the compulsory clauses, the total weekly contribution is 2 shillings (male) and 1 shilling (female). The employer of an insured person deducts one of these two shillings from the male employee's wage and contributes one further shilling himself. In the case of the female employee, each will contribute sixpence. This money is paid weekly by the method of affixing stamps to a card. The stamps will be purchased at the postoffice.

Voluntary contributors will pay the whole of the weekly rate, not exceeding 2 shillings a week (males) and 1 shilling (females). This voluntary rate may be increased after twelve months' operation of the act.

The scheme will be administered by a board which will control contributor's associations of not less than 1,000 members. Existing "friendly societies," one of the present functions of which is to supply contract medical benefit to the members, will be allowed to become approved societies under the act, but the funds must be kept separate. The proposed scheme will follow the general lines of the system of national insurance in operation in Great Britain.

MEDICAL AND PUBLIC OPINION

The medical profession of Australia tends to be opposed to national insurance. The weekly sum of 27 shillings and sixpence is considered insufficient to maintain a worker's home satisfactorily; much less will it pay the cost of medical care. As the "friendly societies" will be recognized as approved societies under the act, their position will be strengthened, and the medical profession views possible future situations with misgiving. In the past the "friendly societies," as collective bargainers for medical attention for their members, have not merited the whole-hearted respect of the profession. Should medical benefit be later included, the approved societies would be the administrative agents, and such a relationship would not be welcomed by the profession. Contract medical practice has many shortcomings. The low rate of from £1 to £2 annually paid to the contracting medical man economically necessitates a large number of members being included on his list with a consequent congestion of his waiting room and visiting list.

The commercial section regards with dismay what it considers will be an added burden on industry. In the case of many business organizations it is feared that the extra few pence, as in the case of Micawber, will make the difference between solvency and disaster. Theoretically the employer pays only 1 shilling a week, but in practice he will also pay, first, as a taxpayer, his share of the government's contribution; secondly, the added cost of commodities that will need to be passed on, and thirdly, the increased wage of the employee, which will need to be augmented as a result of the raised cost of living. There is a danger of a vicious economic spiral being formed. The cost of administration of the scheme is estimated at £200,000 a year.

During the past two years, a child endowment scheme in New South Wales, which was introduced by enthusiastic social legislators, had to be scrapped after a few months' trial as it was economically unsound.

The business community is utilizing the present juncture to call a halt to uneconomic social legislation. It has too long paid the piper to play for the amusement of others. All sections of the community, even the friendly societies themselves, which fear that their function will be usurped, are suspicious and awed by the magnitude of the scheme. The wage-earning section of the community is rapidly adopting the philosophy of Omar Khayyam. Such an attitude may be poetic, but economically it is disastrous. It reacts on the medical profession by overcrowding the "free" hospitals in spite of hospital by-laws to check the "gate-crasher" and the improvement. Many a practicing physician sees, in his accumulating bad debts, further straws that show which way the wind is blowing. "To put aside a bit for the rainy day" is a motto that will soon be rarely applied. It is admitted that sickness insurance and superannuation is a working policy in a business organization; but to argue from that to a national scheme is to disregard the drifters and the happy-go-lucky type, and to encourage the improvement.

National insurance is decidedly utopian; in theory it is workable, but in practice many difficulties will undoubtedly arise. The best that can be said of the originators is that they have the noblest intentions.

BERLIN

(From Our Regular Correspondent)

Nov. 24, 1928.

The Determination of Fatherhood

A new method for the determination of fatherhood is proposed by Professor Zangemeister (gynecology) of the University of Königsberg, as set forth in an article in the *Münchener medizinische Wochenschrift*. Heretofore, the determination of fatherhood could be established by means of a blood group test only when the child had blood qualities which the mother lacked and which only one of the men concerned possessed. But that occurs in only one fourth of the cases. Zangemeister based his experiments on the supposition that the mother forms, against the albumin of the sperm of the male, serologically demonstrable antibodies, which are not directed against sperm in general but possess an individual character. On the advice of the physicist Professor Gans of Königsberg, he used the new Zeiss graduated photometer, which enables one to record in serum mixtures changes in the turbidity, from the standpoint of time and degree, before they are recognizable by the usual methods, and which makes it possible to replace the former essentially qualitative observation with a quantitative determination. With the aid of the photometer, Zangemeister found four new serum reactions. Thus he succeeded in demonstrating pregnancy as such by examination of the serum. On mixing the serum of the child with the serum of the supposed father, the reaction occurred, whereas it did not occur when it was mixed with the serum of a strange man. In the same manner, relations between mother and child and between father and mother could be demonstrated. The importance of these experiments does not lie, at present, in the practical utilization, for that will necessitate more extensive experiments, particularly with older children and with animals. For that purpose, Zangemeister thinks the cooperation of other investigators will be needed.

Flatfoot, a Widespread Deformity

For a long time, flatfoot was considered only from a purely medicosurgical point of view, but in recent years the social aspects of the problem have come more into the foreground, since it has become known that the condition is exceedingly widespread. In a recent article in the *Deutsche medizinische Wochenschrift*, the orthopedist Dr. Gustav Muskat suggests that strenuous efforts be made to combat and prevent its occurrence or development. A peculiar thing about flatfoot is that both sexes of all races are affected by it, the incidence of the deformity being much the same in all countries. There are, however, certain callings (waiters, bakers, dentists) in which the condition occurs more frequently than others, but a large number of flat feet are found even among mountain dwellers who, from early youth, carry heavy burdens and wear coarse shoes. A large percentage of persons with flatfoot are incapacitated part of the time. Whereas formerly the incidence among men was approximately twice that among women, flatfoot has become, in recent years, more and more, a disorder affecting chiefly women. Formerly, the relative incidence was as 9 to 5, against the men; now it is as 3 to 5, against the women. That is explained by the fact that women today are more frequently "gainfully employed" than formerly, and by the further fact that they have heavier burdens to bear in the household; in fact, flatfoot is sometimes designated as an occupational disease of the housewife and domestics, developing as a natural result of housework. If one considers the high incidence of the condition among school children (50 per cent of all children are flatfooted or have the disposition thereto), anxiety concerning the progressive damage to public health seems justified. Even in countries with better economic conditions, as the United States, the widespread incidence of flatfoot has attracted attention, with the result that special attempts have been made to awaken the interest of the general public in the problem, in order that the proper prophylactic measures may be instituted in season. Flatfoot is probably acquired in 90 per cent of cases and the resulting harm may be prevented if an early diagnosis is made and prompt action is taken to relieve the condition. Investigations in the schools reveal an increase of flatfoot in the upper classes and among the older pupils. The highest incidence, after early childhood, is doubtless found in the 10-20 and the 20-30 age groups. After age 30, patients are commonly compelled to give up their former occupations and to seek lighter employment. It is imperative, therefore, that during the preschool age, in the schools, on the playgrounds, on the athletic fields, in the choice of a life calling and in all phases of economic and industrial life, all possible damages from flatfoot be eliminated. Medical science can check the development of the deformity and overcome severe changes through operation, thus restoring the ability to walk and the earning capacity of the patient.

Adaptability for the Medical Profession

Eight years ago, Professor Moritz of Cologne sent, to nearly all university instructors in medicine and to many representatives of the mental sciences, a special questionnaire to bring out their range of adaptability for the medical profession or the particular mental science pursued. He received 1,000 replies from medical men and 800 from leaders in the mental sciences, and in a recent number of the *Münchener medizinische Wochenschrift* he gives an analysis of this material. Only about 10 per cent of university instructors in medicine and 8 per cent of professors of mental science had received their training in *realschulen*, but experimental chemistry had been taught in about 40 per cent of the middle schools. As for visual talents, performances in chemistry, mathematics and physics, occupation with biologic matters and manual arts, and the like, the future medical men, during their school years, had received better visual training than did the other group. However, 10 per cent of the medical men admitted that they were avisual, or deficient in visual insight. In their performances in mathematics, physics and chemistry, the medical men were superior, but what was more observable was the fact that the medical men had a greater liking for these subjects than did the future representatives of the mental sciences. The oncoming medical men showed, in their school years, much more inclination to observe, collect and experiment in the field of the natural sciences than was shown by the future instructors in the mental sciences. Likewise, the former displayed more fondness for manual arts and polytechnical studies and also greater interest in such employments as drawing, painting and modeling. There was no difference with respect to musical talent, but the representatives of the mental sciences showed a greater interest in poetry. Moritz concludes from his researches that the "born" natural scientist and, likewise, the young man who is predestined for the study of medicine possesses a lively interest in nature as a whole and also a strong bent for the observation, study and conquest of it. Mental culture that impels the student to delve deeply into the world of matter and nature in general is a great advantage for the physician, particularly for the practitioner. The student who has these talents will display an interest in and an understanding for the many questions that are associated with the ever widening circles of comparative biology; will have a better understanding for chemistry and physics, which in the laboratory and in animal experimentation are becoming increasingly important, and will be able to derive greater profit from the clinical instruction. At the instance of the faculty of medicine of the University of Göttingen, the premedical course in chemistry and physics has been made much more comprehensive and difficult, with the result that at a recent examination 65 per cent of the candidates failed to pass. The effect has already been felt in the work in the clinics, which is of a higher order than in recent years.

Marriages

LAFAYETTE ABBOTT HEDGES to Miss Minnie L. Kneeland, both of Richmond, Calif., Nov. 19, 1928.

WILLIAM H. SCRUGGS, JR., Gastonia, N. C., to Miss Elizabeth Brown of Newton, Nov. 29, 1928.

RALPH MYRON TANDOWSKY, Salt Lake City, Utah, to Miss Marguerite de Vries, Dec. 14, 1928.

FOUAD H. HANNA, Miami, Fla., to Miss Margaret Alice Wetherell of Sheffield, Ill., recently.

ARTHUR GRAND PRE FALLS, Chicago, to Miss Lillian Steele Proctor of Brooklyn, Dec. 6, 1928.

CHARLES IRA WYNEKOOP, Chicago, to Miss Esther E. Hillquest at New York, Dec. 24, 1928.

EDWARD R. HERMAN, Chicago, to Miss Della Linneman of Bloomington, Ill., Nov. 25, 1928.

HOMER LEE PEARSON, Miami, Fla., to Miss Joeda Holland of Nashville, Ga., Nov. 19, 1928.

WALTER W. SENN to Mrs. F. I. Rohm, both of Williamsport, Pa., Oct. 24, 1928.

ARTHUR A. BASIL, Johnstown, Pa., to Miss Willa Butler, Oct. 3, 1928.

Deaths

Charles Launcelot Minor ⊕ Asheville, N. C.; University of Virginia Department of Medicine, Charlottesville, 1888; member of the Association of American Physicians and the American College of Physicians; past president of the Buncombe County Medical Society, the American Climatological and Clinical Association, the Southern Medical Association, and the National Association for Study and Prevention of Tuberculosis, now known as the National Tuberculosis Association, of which he was a director; part owner of a hospital at Asheville; author of the section on Symptoms and Diagnosis in Klebs' book on Tuberculosis and of many papers on tuberculosis; aged 63; died, Dec. 26, 1928, of angina pectoris.

Arthur Ambrose Sweeney ⊕ St. Paul; Harvard University Medical School, Boston, 1886; member of the House of Delegates of the American Medical Association in 1910; lecturer and formerly professor of medical jurisprudence, University of Minnesota Medical School, Minneapolis; member of the Central Neuropsychiatric Association; at one time on the staffs of St. Luke's and St. Joseph's hospitals; author of "The Measure of Mentality," and other books; aged 70; died, Nov. 7, 1928, of heart disease.

Charles Montraville Green, Boston; Harvard University Medical School, Boston, 1877; member of the Massachusetts Medical Society; formerly acting dean, secretary of the faculty of medicine and professor of obstetrics and gynecology at his alma mater; at one time on the staffs of the Boston City and Boston Lying-In hospitals; aged 78; died, Nov. 20, 1928, at the home of his son in Brookline, of bronchopneumonia, bilateral otitis media and coronary thrombosis.

Clarence Leslie Starr, Toronto Ont., Canada; University of Toronto Faculty of Medicine, 1890; Bellevue Hospital Medical College, New York, 1891; professor and head of the department of surgery, University of Toronto Faculty of Medicine; member of the American Orthopedic Association and the American Surgical Association; on the staff of the Hospital for Sick Children; aged 60; died, Dec. 25, 1928, of heart disease.

John Milton Dunham ⊕ Columbus, Ohio; Detroit Medical College, 1871; at one time professor of diseases of children, Columbus Medical College, and president of the board of trustees and professor of diseases of women, Ohio Medical University; formerly on the staff of the Protestant Hospital; aged 88; died, Dec. 12, 1928, of arteriosclerosis and cardiac decompensation.

William Pfeiffer ⊕ Brooklyn; Cornell University Medical College, New York, 1903; clinical professor of obstetrics and gynecology, Long Island College Hospital; on the staffs of the Carson C. Peck Memorial Hospital, Beth Moses Hospital, Kings County Hospital and the Holy Family Hospital; aged 54; died, Dec. 8, 1928, at the Mount Sinai Hospital.

William Browning Jennings, Haddonfield, N. J.; Jefferson Medical College of Philadelphia, 1888; member of the Medical Society of New Jersey; past president of the Camden County Medical Society; formerly president of the boards of health of Haddonfield and Delaware townships; aged 63; died, Dec. 3, 1928, of pneumonia.

Delbert E. Robinson ⊕ Jackson, Mich.; University of Michigan Medical School, Ann Arbor, 1878; Medical Department of the University of the City of New York, 1881; on the staffs of the W. A. Foote Memorial Hospital and the Mercy Hospital; aged 75; died, Dec. 23, 1928, of thrombophlebitis and rectal abscess.

William Martin Lawyer, Cambridge, Ohio; University of Illinois College of Medicine, Chicago, 1905; past president of the Guernsey County Medical Society; formerly county coroner and county health officer; aged 59; died, Dec. 11, 1928, at the Grant Hospital, Columbus, of nephritis and heart disease.

Walter Philips Robinson, Sapulpa, Okla.; Louisville Medical College, Louisville, Ky., 1904; member of the Oklahoma State Medical Association; served during the World War; aged 48; died, Dec. 2, 1928, at the Lake View Hospital, Danville, Ill., of chronic interstitial nephritis.

William W. Rice, Prescott, Ark.; Beaumont Hospital Medical College, St. Louis, 1898; member of the Arkansas Medical Society; past president of the Nevada County Medical Society; formerly coroner and member of the city board of health; aged 60; died, Oct. 29, 1928.

Charles Henry Grube Haake ⊕ San Francisco; Columbia University College of Physicians and Surgeons, New York, 1913; president of the Shasta County Medical Society; aged 40; died, Dec. 4, 1928, at the University of California Hospital, of myocarditis and duodenal ulcer.

Edgar Reginald Barton, Minneapolis; Medical Department Hamline University, Minneapolis, 1901; member of the Minnesota State Medical Association; served during the World War; formerly mayor of Frazee, Minn.; aged 56; died, Dec. 7, 1928, at St. Cloud, Minn.

Frank John Eversfield, New York; Long Island College Hospital, Brooklyn, 1891; member of the Medical Society of the State of New York; also a dentist; formerly on the staffs of St. Elizabeth's and the Misericordia hospitals; aged 64; died, Dec. 6, 1928.

George W. Thilo, Jr., Chicago; Rush Medical College, Chicago, 1899; member of the Illinois State Medical Society; aged 49; died, Dec. 20, 1928, at the Norwegian American Hospital, as the result of injuries received when beaten and robbed by four thugs.

John Jerome Colgan, Brooklyn; Long Island College Hospital, Brooklyn, 1882; member of the Medical Society of the State of New York; for eight years a member of the board of education of Brooklyn; aged 69; died suddenly, Dec. 5, 1928, of heart disease.

John Esten Keller, Jr., Beacon, N. Y.; Bellevue Hospital Medical College, 1893; member of the Medical Society of the State of New York; served during the World War; aged 56; died at the medical center in New York, Nov. 29, 1928, of heart disease.

Allison E. Lauver, Stronghurst, Ill.; Barnes Medical College, St. Louis, 1899; member of the Illinois State Medical Society; aged 54; died, Dec. 6, 1928, of injuries received when the automobile in which he was driving was struck by a train.

Arthur Carlton Jelly ⊕ Boston; Harvard University Medical School, Boston, 1891; member of the American Psychiatric Association; aged 72; died, Nov. 19, 1928, at the Palmer Memorial Hospital, of arteriosclerosis and pneumonia.

Donald M. Cammann, Merrick, N. Y.; Medical Department of Columbia College, New York, 1879; member of the Medical Society of the State of New York; aged 76; died, Oct. 13, 1928, at the Clifton Springs (N. Y.) Sanitarium and Clinic.

Francis T. Newcomer, Dayton, Ohio; Eclectic Medical Institute, Cincinnati, 1897; formerly on the staff of the Dayton City Infirmary; aged 58; died, Nov. 5, 1928, as the result of cerebral hemorrhage which occurred in September.

Daniel F. Duggan, Alton, Ill.; St. Louis College of Physicians and Surgeons, 1902; member of the Illinois State Medical Society; city health officer; aged 59; died, Dec. 9, 1928, at St. Joseph's Hospital, of lobar pneumonia.

Charles William Stoelting ⊕ Oconto, Wis.; Rush Medical College, Chicago, 1881; on the staff of the Oconto County and City Hospital; aged 75; died, Dec. 15, 1928, as the result of injuries received in an automobile accident.

Emmitt H. Bottom ⊕ East St. Louis, Ill.; Medical Department of Washington University, St. Louis, 1897; on the staffs of the Deaconess and St. Mary's hospitals; aged 55; died, in November, 1928, of cerebral hemorrhage.

⊕ indicates "Fellow" of the American Medical Association.

Andrew Louis MacMillan ⊕ Hanover, Mass.; Albany (N. Y.) Medical College, 1879; for twenty-five years chairman of the board of health; aged 79; died, Nov. 17, 1928, at Concord, N. H., of coronary thrombosis.

Munsell Lee Adair ⊕ Shreveport, La.; University of Texas School of Medicine, Galveston, 1917; served during the World War; aged 33; died, Nov. 17, 1928, at the home of his parents in Marshall, Texas, of chronic nephritis.

Robert Walter Kasting, Cincinnati; Pulte Medical College, Cincinnati, 1910; on the staff of the Bethesda Hospital, and formerly on the staff of the Cincinnati Orphan Asylum; aged 42; died, Dec. 6, 1928, of lobar pneumonia.

Homer Merrick Thomas, Chicago; Rush Medical College, Chicago, 1882; formerly on the staffs of the Mary Thompson and Cook County hospitals; aged 70; died, Dec. 17, 1928, of bronchopneumonia and myocarditis.

Harold Armstrong Sanders, Pasadena, Calif.; New York Homeopathic Medical College and Hospital, New York, 1905; member of the California Medical Association; aged 49; died, March 8, 1928, in Los Angeles.

Horatio Zimmerman Silver ⊕ Eaton, Ohio; Miami Medical College, Cincinnati, 1900; aged 56; died, Dec. 8, 1928, at the Miami Valley Hospital, Dayton, as the result of a bullet wound inflicted by a burglar.

William Ward Goodrich, Coalinga, Calif.; Medical Department of Drake University, Des Moines, Iowa, 1900; member of the California Medical Association; aged 50; died, Sept. 18, 1928.

Francis J. Fralick ⊕ Greenville, Mich.; Kentucky School of Medicine, Louisville, 1894; member of the Radiological Society of North America; aged 61; died, Dec. 8, 1928, of uremia.

Robert **M. Burlingame,** Watertown, S. D.; Medical Department Hamline University, Minneapolis, 1899; aged 55; died, in November, 1928, of malignant hypertension with uremia.

Reinhold **Heidrich,** Dutch Flat, Calif.; Hahnemann Hospital College of San Francisco, 1889; aged 66; died, Dec. 15, 1928, at a hospital in San Francisco, of cerebral hemorrhage.

Charles **H. Rodi,** Pasadena, Calif.; University of Michigan Medical School, Ann Arbor, 1882; formerly a practitioner in Michigan; aged 69; died, Nov. 14, 1928, of arteriosclerosis.

Ernest **Cecil Blackburn** ⊕ Memphis, Tenn.; Memphis Hospital Medical College, 1889; aged 59; died, Nov. 30, 1928, at the Baptist Memorial Hospital, of cirrhosis of the liver.

Robert **Henry T. Nesbitt,** Waukegan, Ill.; Hahnemann Medical College and Hospital, Chicago, 1896; aged 77; died, Dec. 2, 1928, as the result of an injury received in a fall.

Karl **Haas** ⊕ Harrah, Okla.; Southern Medical College, Atlanta, 1898; aged 63; died, Nov. 13, 1928, at the Postelle-Lackey Clinic, Oklahoma City, of cerebral hemorrhage.

Otto **J. Dewitz** ⊕ Chicago; Medical Department of the University of Illinois, Chicago, 1904; on the staff of St. Mary's Hospital; aged 52; died, Dec. 18, 1928, of pneumonia.

William Gedney Birdsall, Beacon, N. Y.; New York Homeopathic Medical College and Hospital, New York, 1888; aged 72; died, Dec. 10, 1928, following an operation.

William **Edward Ogden** ⊕ Rutherford, N. J.; Trinity Medical College, Toronto, Ont., Canada, 1888; aged 60; died suddenly, in December, 1928, of heart disease.

Edward L. Perry, St. Louis; Homeopathic Medical College of Missouri, St. Louis, 1901; aged 54; died, Dec. 5, 1928, of cerebral hemorrhage and arteriosclerosis.

George Winston Iray Brown ⊕ Chicago; Hahnemann Medical College and Hospital, Chicago, 1878; aged 82; died, Dec. 5, 1928, of chronic myocarditis.

Ben Lee Allen, Saluda, S. C.; University of Georgia Medical Department, Augusta, 1896; aged 54; died suddenly, Nov. 26, 1928, of heart disease.

Robert Wickham ⊕ Chicago; Rush Medical College, Chicago, 1887; aged 74; died, Oct. 23, 1928, of carcinoma of the intestine and myocarditis.

Marshall A. Davis, Philadelphia; Jefferson Medical College of Philadelphia, 1886; aged 71; died, Dec. 8, 1928, of carcinoma of the stomach and liver.

William Lee Quivey, East Orange, N. J.; Rush Medical College, Chicago, 1884; aged 68; was found dead in bed, Dec. 7, 1928, of heart disease.

Thomas Wilson Combs, Chicago; Pulte Medical College, Cincinnati, 1885; aged 72; died, Dec. 8, 1928, of prostatic disease.

Bureau of Investigation

TARTAROFF

"Tartaroff," sold by the Tartaroff Company of Chicago, is exploited as a "marvelous discovery" that "acts like magic on the teeth." To quote:

"Tartaroff is the greatest scientific discovery of the age. Nothing like it ever prepared before. It is not a tooth paste but a simple, harmless preparation that can be applied to the teeth in a few seconds. Immediately the teeth are transformed into gems of pearl white beauty."

This preparation has recently been the subject of a chemical investigation by the American Dental Association and a report has been published on the subject in the *Journal of the American Dental Association* for November, 1928. It appears from the analysis, that Tartaroff is, for all practical purposes, a mixture

Teeth—as white, clean and sparkling as Precious Deep Sea Pearls—can now be yours in the magic of a moment

NO matter how dark or discolored, how yellow or stained your teeth now may be—as if by magic, a moment's application of TARTAROFF will instantly, yet harmlessly remove the film and the tartar, and all tobacco, nicotine, fruit, vegetable and medicine stains. TARTAROFF is not intended to take the place of tooth pastes and powders. Just one application of this harmless, wonder-working preparation WILL TRANSFORM the most unsightly, discolored teeth into veritable gems of radiant white. TARTAROFF is sold by all reliable drug stores. Some druggists may offer you an imitation or counterfeit of TARTAROFF so beware of this kind of a druggist, go to a RELIABLE DRUG STORE and if they haven't Waddell's TARTAROFF send us 25 cents and we will see that you get it by return mail.

TARTAROFF CO. 2569 Lincoln Ave. Chicago, Ill.

of hydrochloric acid and water, with a little coloring matter added. The claim that a 1.2 per cent solution of hydrochloric acid is harmless to the teeth is pernicious to a degree. Such a preparation has no rightful place in the field of self-treatment.

SEMAFOR

A Dentomedical Nostrum

Indicator Laboratories, Inc., of Chicago puts out a preparation, "Semafor," that, it is claimed, "combats unpleasant Breath (Halitosis), Acidity, Mouth Infections (Sepsis), and Tooth Decay, by its Cleansing, Healing, Germicidal Action—and removes sticky film." Semafor is described as the "New *Red* Purifier that turns *White* when disorders lurk in mouth and throat." Thus:

"It stays RED in healthy mouths and KEEPS them healthy—Keeps teeth sound and dazzling white—Keeps breath sweet—mouth clean and pleasant.

"At the first sign of danger—Acidity, Decay, Sepsis, or Halitosis—Semafor warns you by turning WHITE."

One learns, further, from the advertising that Semafor is the creation of a "Dr. Alfred H. Kropff, B.S., M.A., Ph.D., a national authority on purifiers." The public is told that, during the World War, Dr. Kropff supplied the United States government with many millions of tubes of water purifier, and that, later, he was called on by an eminent dentist to undertake research in mouth hygiene. This research, it is said, led to the "discovery" of Semafor. So much for the story. The Semafor label, however, states that it is a patented product (patent number 1112180). The specifications for this patent show that it was issued in September, 1914, before the advent of the World War and that it was issued to one Charles W. Westenfelter of Springfield, Ohio. Nowhere in the patent specifications does the name of Alfred H. Kropff appear. Just how these conflicting factors can be reconciled we leave for Indicator Laboratories, Inc., to explain. The modus operandi of Semafor is thus described in the advertising:

"SEMAFOR, a red liquid, *by changing white or by retaining its color* reveals when acids are present in the throat and mouth. While an *acid*

condition is present from any cause, and this includes inflammation and infection, SEMAFOR will decolorize and be expectorated white. As the *degree of acidity is diminished,* SEMAFOR is expectorated pink. When SEMAFOR has *neutralized all of the acids present* at that rinsing or gargle-period, it is expectorated red—in other words, there is no change in color—showing that SEMAFOR has done all that any antiseptic can do at the time. It indicates the degree of acidity present by the number of gargles and rinses required to restore the red color."

As has already been mentioned in these columns, the American Dental Association has, during the past year, initiated a service to its members and the public of giving the facts regarding widely advertised medicinal preparations in the dental field. The chemist of the American Dental Association, working for the time being in the Chemical Laboratory of the American Medical Association, has examined, and is examining, products of this type. Semafor was analyzed some weeks ago and the report of the chemist published in the dental profession's national organ—the *Journal of the American Dental Association* for December, 1928. According to the chemist's report on Semafor, the product "is shown to be nothing more than a simple saline solution to which a little alcohol, sodium carbonate and an indicator, in the form of phenolphthalein, have been added."

The chemist states further that a solution having essentially the same composition as Semafor may be made from the following formula:

Sodium chloride (salt)	5 drachms
Sodium carbonate	11 grains
Sodium sulphate	5 grains
Phenolphthalein	½ grain
Alcohol	2½ ounces
Water to make	12 ounces

The selling point of Semafor is that of getting the public to believe that, if the diluted pink Semafor solution, when put in the mouth, is partially or wholly decolorized, the user is suffering from "acid mouth." The fact (well known to physicians but not so well known to the general public) that normal saliva from perfectly healthy mouths is faintly acid in reaction makes it obvious that the vast majority of people who would use Semafor would find this solution partially decolorized. They will also find, as a matter of course, that if, at the time of using Semafor, they repeatedly rinse their mouth with this alkaline solution, with each rinsing the solution that is ejected will be nearer the normal Semafor solution color. This will further convince the public that their mouths are being "disinfected," although, of course, the product is not a germicide in any practical sense of the word.

Correspondence

INTERNATIONAL CONGRESS OF OPHTHALMOLOGY

To the Editor:—Although an invitation to apply for membership in the International Congress of Ophthalmology, which will meet in Amsterdam and Scheveningen, Sept. 5-13, 1929, has been sent by the Holland committee to each ophthalmologist listed in the Directory of the American Medical Association, I am informed that a number of such invitations have not reached their proper destination. I shall therefore be much obliged to you if you will publish in an early issue of THE JOURNAL the following directions:

An international ophthalmologic congress will be held in Amsterdam and The Hague (Scheveningen), Sept. 5-13, 1929.

Any member desiring to read a paper at this congress should prior to June 1, 1929, send an abstract, containing the principal conclusions, to the secretary, Prof. Dr. Zeeman.

No communication on any subject will be admitted unless the respective abstract has been received by Professor Zeeman not later than June 1, 1929.

The subscription amounts to 25 Dutch florins ($10).

Applications for membership should be sent as early as possible to the secretary of the National Committee, Prof. Dr. W. P. C. Zeeman, Wilhelmina Hospital, Amsterdam, Holland, and the subscription to the treasurer, Dr. H. M. Roelofsz, managing director of the Incassobank, 531 Heerengracht, Amsterdam.

For the International Council:
J. VAN DER HOEVE, Chairman.
E. MARX, Secretary.

For the National Committee:
J. VAN DER HOEVE, Chairman.
W. P. C. ZEEMAN, Secretary.
G. E. DE SCHWEINITZ, M.D., Philadelphia.
American Member of the International Council.

THE NEWTON BILL FOR THE CHILDREN'S BUREAU

To the Editor:—The publication of an editorial (THE JOURNAL, December 1, p. 1721) on the projected continuation of the provisions of the Sheppard-Towner Act in a more extended form prompts this letter of commendation for the consistent attitude of THE JOURNAL in opposition to legislation of this type and also for its efforts to halt such ill considered social welfare activities.

My personal interest in this subject dates from the early efforts of the federal Children's Bureau to extend its field of endeavor by legislative enactment and I have always been firmly opposed to the manner in which the national government has attempted to direct and control the maternal welfare activities of this country by measures such as the Sheppard-Towner Act. Although voicing my opposition on many occasions, nevertheless I am fully in accord with every legitimate effort to improve the care of women in childbearing. But I am not convinced that any improvement has resulted from federal financial participation in state activities along these lines. It seems to me that careful thought should be given to the Newton bill by the members of the profession, both as citizens and as physicians. Much as we may desire in either capacity to provide for the best obstetric care, the question may well be asked whether an approach to a millennium will result from a project that places the entire matter in the hands of the federal Children's Bureau, a lay organization developed originally for an entirely different purpose. Will as much be gained by launching a constantly

increasing army of inquiring social welfare workers and nurses on prospective mothers, as by a process of education which will impress the importance of obstetrics on medical students, physicians and the public at large? I am frank enough to say that I do not believe it will.

Success in any venture must be measured by accomplishments. In view of the period of time during which the Sheppard-Towner Act has been functioning, it would appear desirable for the advocates of the new measure to present concrete facts to confirm their claims. Thus far I have heard little but more or less generalized statements, which are scarcely in accord with the constantly recurring tales of how bad is American obstetric practice and how our puerperal death rate continues to be the shame of the civilized world. The situation in this country is peculiar, to say the least. The almost universal prosperity, the altruism which permeates so widely, the desire for organization and extreme standardization, the attempts toward centralization of government in the national Capital, the tendency for medicine to become socialized, the transformation of a nation of individualists into a nation of collectivists, and a final resort to law to overcome what cannot readily or quickly enough be done by persuasion or instruction—all of these contribute to the development of widespread social welfare movements, of which the Sheppard-Towner Act is but a familiar instance. A great nation, we should be foremost in providing for the health and welfare of our people, but the question may again be asked whether this can be done by means such as those advocated. Should, for example, a minor departmental bureau of the government, under lay auspices, gradually assume the rôle of sole arbiter, both scientific and financial, of such an important function as the supervision of pregnancy? If the federal government finds it incumbent to enter into the discussion or aid in the solution of those problems which are concerned with the high mortality rate from childbearing, let this be done by a scientifically staffed department such as the Public Health Service, and let its activities be of a research and advisory character rather than financial meddling with the work of the individual states.

Community effort in maternal welfare work has always impressed me as being of the greatest importance in the successful carrying out of the necessary procedures to secure better care in childbirth. Whatever help to such endeavors can be given by larger governmental units should be gratefully acknowledged, but direct control of local expenditures of funds and local administration of health activities are not wise and satisfactory procedures. Uncle Sam can, with great advantage to all concerned, act in an advisory capacity in these matters; this can be done through the medium of an existent agency, the Public Health Service with its trained medical personnel, rather than through the bureau of a department that can have only an indirect interest in the matter.

I sincerely trust that the editorial will be the means of calling the attention of medical men to this very important controversy and that it will lead to a determined stand in opposition to the projected legislation. Every effort is being made by those concerned in the teaching of obstetrics to impress on the profession the great importance of this branch of medicine and how, in order to bring about improved maternity care, it is essential that better training in this branch be provided by medical schools and hospitals. I believe that this cannot be done if the medical participation in the scheme is of minor importance and the major effort expended on the development of a variety of more or less unessential activities. Better results in mortality and morbidity rates will not be secured in this fashion and it is a waste of time and effort, as well as clouding the issue, to attempt a solution by the means advocated in the Newton bill.

The Board of Trustees of the American Medical Association is to be congratulated on its stand in this matter and it is to be hoped that its action will be fully endorsed by medical organizations and individual physicians who are interested in this important question.

GEORGE W. KOSMAK, M.D., New York.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

INJECTION OF VARICOSE VEINS

To the Editor:—With regard to an article by Jacques Forestier on "Varices of the Lower Limbs" (THE JOURNAL, June 16, p. 1932), since arms are also considered limbs, it would be difficult for the novice in this art to understand whether the author means the entire leg, or the leg below the knee. Is this method applicable only to varices below the knee? I often see varices that show very markedly on the leg only above the knee. Is it unsafe to use the injection treatment in these cases? Please omit name.

M.D., Minnesota.

ANSWER.—The advisability of injecting sclerosing solutions into varicose veins above the knee is a much debated question. Some men do not hesitate to inject the vein as high up as the femoral junction and another group prefers to ligate the vein at the highest palpable point and then make injections below the ligation; again, others believe in injecting the veins up to the middle third of the thigh. The objection made to the ligature of the vein is that a thrombus will originate proximal to the ligature, which is far less attached to the wall of the vein than the thrombus produced by the injection. While it is difficult to lay down hard and fast rules, it seems safer not to inject above the middle third of the thigh and, if an injection becomes necessary, to ligate the vein proximal to the injection. These patients should not be immobilized but permitted to go home immediately after the ligature, as anything that will cause stasis in the deeper veins can predispose to embolism.

SKIN IRRITATION FROM CHEMICALS USED IN AIRPLANE MANUFACTURE

To the Editor:—I have recently had a case of dermatitis of the hands in a young man employed in the "dope room" of an airplane factory. The disturbance is manifested by large red blotches in the palm, accompanied by intense itching and low grade paronychia. The substance in which the patient's hands are practically immersed all day is said to be composed of nitric acid, gun cotton, ethyl alcohol and acetone. It is painted on the cloth used for wings and on extra tapes which have to be smoothly spread over ridges of wood in the wings. The latter part of the process is done with the tips of the fingers and the nails, for no other adequate method has been found by which to do this delicate work. The mixture is removed from the hands by vigorous scrubbing and scraping and further dissolved with acetone. Pure glycerin has been used to counteract the dryness of the skin. Kindly inform me if this occupational hazard has been reported and if anything further is known concerning the ingredients of the "dope." Are there any suggestions as to protective measures? It seems to me that glycerin used over a long period would tend to make the skin more susceptible to injury. Gloves are said not to be practical.

BLANCHE NORTON, M.D., New York.

ANSWER.—The materials mentioned are known to produce skin lesions. It is unlikely that any nitric acid remains in the nitrocotton employed in this nitrocellulose lacquer or "dope." Nitric and sulphuric acids are employed in the nitration of ordinary cotton, but this is carefully washed out prior to its use in lacquers. Technically speaking, gun cotton is not used in these lacquers, but nitrocotton or nitrocellulose, or pyroxylin. The degree of nitration in the last named substances is less than 12.5 per cent (usually 11 per cent). If nitration is carried beyond 12.5 per cent (especially around 14.14 per cent), gun cotton is formed and explosions are possible. The ethyl alcohol employed in this lacquer is likely to be denatured by the presence of 2 per cent benzene or by methyl alcohol. Their presence increases the possibilities of dermatitis. In addition to the mentioned ingredients, it is probable that some acetates, such as butyl, amyl or ethyl acetate, are employed together with some plasticizer. All in all, there are ample sources of dermatitis in the work indicated.

The paronychia is characteristic. This may be followed by or associated with a vesicular dermatitis of the back of the hands and fingers. Later, fungi may find their way into the

lesions and the condition be long perpetuated, even after cessation of work. The red blotches are not believed to be characteristic, and suggest that the purpura of benzene poisoning may be present. The occurrence of a leukopenia would strongly indicate a systemic benzene poisoning in addition to the skin lesions.

The use of a superfatted soap is helpful. Soaps are not soluble in common paint solvents. This principle may be employed to introduce a protective layer between the skin and the harmful agents. Hydrous wool fat is the fat of choice in this superfattation. Such a material should be applied in a thin layer two or three times daily. At the end of the day's work, after careful cleansing, the hands should be treated with any mild fatty material, such as oil of theobroma, hydrous wool fat, or ointment of rose water.

X-RAY IN TUBERCULOSIS

To the Editor:—Is there such a thing as healed miliary tuberculosis? How can one differentiate roentgenologically between a healed tuberculous bronchopneumonia, showing disseminated calcified infiltrations, and a healed miliary tuberculosis? What is the roentgenologic picture in Pick's disease?

J. MARSH FREERE, M.D., Chattanooga, Tenn.

ANSWER.—Cases of healed miliary tuberculosis have been reported. They are usually discovered in the course of a roentgen study of the chest. The plate shows minute points of calcification throughout the lung or lungs. As the Germans have described this condition, the plate resembles the picture of a snow storm. On the other hand, a healed bronchopneumonia of tuberculous origin would give a more confluent fibrotic appearance instead of the fine pinhead size calcifications of the miliary form. Pick's disease will not show any pathologic changes of the lung in a roentgenogram unless a pleurisy with effusion is present.

TECHNIC FOR BARIUM SULPHATE MEAL TEST

To the Editor:—Please give me the technic for the barium sulphate meal test. How many pictures should be taken and how far apart?

R. F. SHEETS, M.D., Carthage, Ill.

ANSWER.—The technic used for roentgen study of the gastrointestinal tract followed in many hospitals consists of a motor meal and a study meal.

The motor meal is given at 6 a. m. and consists of cream of wheat, 6 ounces; skimmed milk, 11 ounces; barium sulphate-U. S. P., 3 ounces, and sugar to sweeten. At 10 a. m. the first plate is taken. The plates are taken every half hour if the stomach is not empty.

The study meal (when the stomach is empty) consists of barium sulphate, 4 ounces; sodium bicarbonate, 1 teaspoonful; orange syrup to sweeten, and water, 12 ounces. The plates may then be taken after fluoroscopic examination if desired.

USE OF ARSPHENAMINE IN COMBINATIONS

To the Editor:—Is it safe to give intravenously arsphenamine that has been mixed in one syringe with mercury oxycyanide (Swan-Myers) or with colloidal bismuth (J. Doak and Company)? A friend of mine, a physician, told me that he was giving them without any harm to the patient. Please omit name.

M.D., Ohio.

ANSWER.—The tendency of solutions of arsphenamine sodium to decompose is such that, as a general principle, it is unwise to administer other therapeutic substances in the same solutions.

No examination of Bismuth-Diasporal (J. Doak and Company) has been made by the American Medical Association Chemical Laboratory nor has such examination by the Council on Pharmacy and Chemistry been requested by the manufacturers.

DIPLOPIA OF MALINGERING

To the Editor:—Are there any infallible eye tests to disprove diplopia (lateral) binocular single vision in a suspected malingerer claiming diplopia after having had an electric wire burn of moderate severity (second degree) of the hips and shoulders? Please omit name.

M.D., Florida.

ANSWER.—There is no such thing as diplopia (lateral) binocular single vision. If a person has binocular single vision in all directions, he has no diplopia; while if there is a diplopia, he does not have binocular single vision in all directions. The diplopia of malingering is most easy to detect unless the patient is thoroughly conversant with the subject of ocular muscles. If any one or more ocular muscles are paralyzed, partially or completely, there result definite images of a point of light when viewed with a red glass before one eye and no glass before the other. The relative position of the two images thus produced is definite and it requires an unusually smart malingerer to give the proper answers. False answers will reveal immediately the impossibility of the situation and the certainty of falsehood on the part of the patient. For the position of the images with paralyses of the various muscles, the reader is referred to any of the standard textbooks on ocular muscles, such as that of Peters.

GEORGE A. BREON AND SCIENTIFIC MEDICINE

To the Editor:—Some few months ago, in commenting on a fraud order that had been issued, you mentioned that one of the parties concerned in the matter, George A. Breon, was an old offender. Clever detail men in selling to the medical profession are claiming that most of the Breon products are "Council passed." What are the facts?

Prescription Druggist. L. D. BRACKEN, Seattle.

ANSWER.—No products of George A. Breon or of the George A. Breon Company have ever been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies. George A. Breon and Company is a concern that has carried water on both shoulders. On the one hand, it appeals to uncritical and unscientific physicians with a series of prescription products that are both uncritical and unscientific; on the other hand, it has made a number of nostrums for fraudulent mail-order concerns, and George A. Breon himself is reported to have been the originator of some of the nostrums.

"Virex," a fraudulent deafness cure dealt with in THE JOURNAL, Feb. 27, 1926, was marketed by a syndicate of quacks and advertising agents. According to the report of the postal authorities, Virex was manufactured by George A. Breon and Company. The Virex outfit was declared a fraud and debarred from the United States mails.

The Warren Laboratories (there were no laboratories), another Kansas City medical mail-order fakery, run by the same syndicate that operated the Virex fraud, sold "Clear-Plex" and "Plex-Tone," both of which, according to the federal report, were claimed to have been "discovered" by George A. Breon and were made by George A. Breon and Company. The Warren Laboratories concern was declared a fraud by the government and the matter was dealt with in THE JOURNAL, Feb. 27, 1926.

The Hilton Laboratories (there were no laboratories) was another trade name used by the quacks who sold Virex, Clear-Plex, etc., under which they sold a fraudulently exploited product, "Hilton's Vitamins." The preparation, according to the government's fraud order data, was made by George A. Breon and Company. The Hilton Laboratories was declared a fraud and debarred from the mails; the case was discussed in THE JOURNAL, Feb. 27, 1926.

The King Laboratories (King was a fictitious name and there were no laboratories) was still another trade name used by the Virex-Clear-Plex-Hilton's Vitamins quacks to sell a fraudulently exploited pyorrhea cure, "King's Combined Pyorrhea Treatment." The federal authorities reported that the "King treatment" was "discovered" by George A. Breon. The King Laboratories scheme was declared a fraud. The matter was dealt with in THE JOURNAL, Feb. 27, 1926.

The Green Laboratories (there were no laboratories) sold "K-17," or "Rattlesnake Oil," a mail-order deafness cure fake marketed by one Cooley H. Greene. According to the government report, K-17 was manufactured by George A. Breon. The Green Laboratories concern was declared a fraud and debarred from the mails. An article on it appeared in THE JOURNAL, Sept. 18, 1926.

The Florence Laboratories (there were no laboratories) of Kansas City, Mo., exploited several fraudulent mail-order remedies. The genesis of the business, according to the government report, was when Breon proposed to a Mrs. Shearer that the mail-order quackery be started and that he (Breon) would make the products. Breon later withdrew as an officer of the concern, but his company continued to make the Florence Laboratories products. The concern was finally declared a fraud and the matter was dealt with in THE JOURNAL, Jan. 29, 1927.

The Oritone Laboratories (there were no laboratories) was a mail-order fake operated first by George J. Lyell and later by Lyell H. Carver. The product sold was an alleged aphrodisiac, "Oritone," which, according to the federal report, was made for these quacks by George A. Breon and Company. The Oritone concern was declared a fraud and debarred from the mails. The matter was dealt with in THE JOURNAL, Feb. 19, 1927.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 8-11, 1929. Sec., Miss Bessie Tucker, 519 Dexter Ave., Montgomery, Ala.

CALIFORNIA: Los Angeles, Feb. 4-7, 1929. Sec., Dr. Charles B. Pinkham, 420 State Office Building, Sacramento, Calif.

COLORADO: Denver, Jan. 8, 1929. Sec., Dr. Philip Work, 324 Metropolitan Bldg., Denver, Colo.

CONNECTICUT: Basic Science; *prerequisite* to examination for medical license; New Haven, February 9. Address State Board of Healing Arts, 1895 Yale Station, New Haven, Conn.

DISTRICT OF COLUMBIA: Washington, Jan. 8, 1929. Sec., Dr. Edgar P. Copeland, Suite 110, 1801 Eye St., Washington, D. C.

HAWAII: Honolulu, Jan. 14, 1929. Sec., Dr. James A. Morgan, Room 48, Young Bldg., Honolulu, Hawaii.

ILLINOIS: Chicago, Jan. 22-24, 1929. Supt. of Registration, Dr. V. C. Michels, Springfield, Ill.

KANSAS: Topeka, Feb. 12, 1929. Sec., Dr. A. S. Ross, Board of Medical Registration and Examinations, Sabetha, Kan.

MINNESOTA: Minneapolis, Jan. 15-17, 1929. Sec., Dr. A. E. Comstock, 524 Lowry Bldg. St. Paul, Minn.

NATIONAL BOARD, Parts 1 and 2: All class A medical schools, Feb. 13-15, 1929. Sec., Mr. Everett S. Elwood, 225 South Fifteenth St., Philadelphia, Pa.

NEW YORK: Syracuse, Albany and Buffalo, Jan. 28-31, 1929. Chief, Mr. Herbert J. Hamilton, Department of Education, Educational Building, Albany, N. Y.

PENNSYLVANIA: Harrisburg, Jan. 8-12, 1929. Director, Dr. C. D. Koch, Board of Medical Education and Licensure, Harrisburg, Pa.

SOUTH DAKOTA: Pierre, Jan. 15, 1929. Director, Dr. H. R. Kenaston, Bonesteel, S. D.

VERMONT: Burlington, Feb. 12, 1929. Sec., Dr. W. Scott Nay, Underhill, Vt.

WASHINGTON: Basic Science: Olympia, Jan. 10, 1929. Director, Mr. Charles Maybury, Department of Licenses, Olympia, Wash.

WASHINGTON: Olympia, Jan. 14, 1929, Director, Mr. Charles Maybury, Department of Licenses, Olympia, Wash.

WISCONSIN: Madison, Jan. 8-10, 1929. Sec., Dr. Robert E. Flynn, 315 State Bank Bldg., La Crosse, Wis.

BOARD OF DIRECTORS AND EXAMINERS OF THE AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

Since publishing the resolutions of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, which appeared in THE JOURNAL, November 24, on page 1654, we learn that the paragraph relating to the board of directors and examiners should have included the statement: "Three to be appointed for five years by the American Gynecological Society."

Indiana June Examination

Dr. E. M. Shanklin, secretary of the Indiana State Board of Medical Registration and Examinations, reports the written examination held at Indianapolis, June 26-28, 1928. The examination covered 15 subjects and included 100 questions. An average of 75 per cent was required to pass. There were 108 candidates examined, including 5 osteopaths, and passed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Northwestern University Medical School		(1928)	88.6
University of Illinois College of Medicine		(1928)	89.9
Loyola University School of Medicine		(1928)	87.8
Indiana University School of Medicine		(1927)	83.5, 88.2, (1928) 79.5, 79.7, 80.4, 80.8, 81.3, 82, 82.7, 82.8, 83.2, 83.2, 83.4, 83.4, 83.6, 84.2, 84.4, 84.4, 84.7, 84.7, 84.7, 84.8, 84.8, 84.8, 84.8, 85.2, 85.4, 85.5, 85.5, 85.6, 85.7, 85.9, 85.9, 86. 86, 86, 86.1, 86.2, 86.3, 86.3, 86.3, 86.4, 86.5, 86.6, 86.6, 86.9, 86.9, 86.9, 87, 87.1, 87.1, 87.1, 87.4, 87.5, 87.5, 87.6, 87.7, 87.8, 87.8, 87.8, 87.9, 87.9, 88, 88.1, 88.2, 88.6, 88.7, 88.7, 88.8, 88.9, 89, 89.1, 89.3, 89.4, 89.6, 89.8, 90, 90.1, 90.2, 90.2, 90.2, 90.7, 90.9, 91, 91.2, 91.7, 91.7
University of Michigan Medical School		(1927)	82.3
St. Louis University School of Medicine		(1928)	89.0
New York University Medical College		(1884)	75.2
Eclectic Medical College		(1927)	86.1, (1928) 89.8, 92.0, 92.0, 93.2
Jefferson Medical College of Philadelphia		(1928)	87.0
Womens' Medical College of Pennsylvania		(1926)	85.3
Hahnemann Med. Coll. and Hosp. of Phila., Homeo		(1928)	86.1
University of Toronto Faculty of Medicine		(1916)	90.7
Osteopaths			85.2, 89.8, 90.7, 90.8, 91.8

South Carolina June Examination

Dr. A. Earle Boozer, secretary of the South Carolina Board of Medical Examiners, reports the written examination held at Columbia, June 26-28, 1928. The examination covered 17 subjects and included 80 questions. An average of 75 per cent was required to pass. Forty-six candidates were examined and all of them passed. Five physicians were licensed by reciprocity with other states and two by endorsement of credentials. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
University of Arkansas School of Medicine		(1927)	85.1
Howard University School of Medicine		(1927)	85.2
Emory University School of Medicine		(1927) 86.7, (1928)	87.3
University of Pennsylvania School of Medicine		(1927)	86.7
Jefferson Medical College of Philadelphia		(1928)	88.0
Medical College of the State of South Carolina		(1928)	79.3, 81.5, 82.8, 83.1, 83.8, 83.8, 83.8, 85.1, 85.1, 85.3, 85.3, 85.6, 85.7, 86.5, 87.1, 87.3, 87.5, 87.5, 87.7, 87.7, 87.8, 88.1, 88.1, 88.1, 88.2, 88.3, 88.3, 88.8, 89.2, 89.5, 89.5, 89.6, 89.6, 90.1, 90.1, 91, 92.3
Meharry Medical College		(1928)	84.8, 85.5
University of Virginia Department of Medicine		(1928)	87.5

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Univ. of Georgia Med. Dept.		(1924) (2), 1925), (1927) (2)	Georgia

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement with
Johns Hopkins University School of Med.		(1923), (1926)	N. B. M. Ex.

Porto Rico September Examination

Dr. Diego A. Biascoechea, secretary of the Board of Medical Examiners of Porto Rico, reports the written and practical examination held at San Juan, Sept. 4-8, 1928. The examination covered nine subjects and included 90 questions. An average of 75 per cent was required to pass. Of the 8 candidates examined, 7 passed and one failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
University of Arkansas School of Medicine		(1926)	77.0
George Washington University Medical School		(1928)	83.8, 85.5
University of Georgia Medical Department		(1928)	75.1
Boston University School of Medicine		(1928)	80.4
Jefferson Medical College of Philadelphia		(1928)	90.6
University of Madrid		(1927)*	78.1
	FAILED		
Chicago College of Medicine and Surgery		(1916)	69.5

* Verification of graduation in process.

New Hampshire September Report

Dr. Charles Duncan, secretary of the New Hampshire State Medical Board, reports the oral, written and practical examination held at Concord, Sept. 13-14, 1928. The examination covered 12 subjects and included 120 questions. An average of 75 per cent was required to pass. One candidate was examined and passed. There were fifteen physicians licensed by reciprocity with other states. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Tufts Medical College		(1928)	86

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Yale University School of Medicine		(1921)	Mass.
Baltimore Medical College		(1905)	Dist. Colum.
Harvard University Medical School		(1911), (1925)	Mass.
Boston Univ. School of Medicine		(1921) (1903), (1926)	R. Island Massachusetts
Tufts College Medical School		(1913)	Mass., (1926) (2)
St. Louis University School of Medicine		(1911)	New York Illinois
Columbia Univ. Coll. of Phys. and Surgs.		(1906)	Conn., (1911) New York
University of Vermont College of Medicine		(1906), (1925)	Vermont

Hawaii October Examination

Dr. James A. Morgan, secretary of the Board of Medical Examiners of Hawaii, reports the written examination held at Honolulu, Oct. 8-11, 1928. The examination covered 10 subjects and included 55 questions. An average of 75 per cent was required to pass. There were 11 candidates examined and all of them passed. One physician was licensed by endorsement of credentials. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
University of Colorado School of Medicine		(1926)	80.4
Emory University School of Medicine		(1928)	76.2
Northwestern University Medical School		(1924) 84.3, (1928)*	81.1
University of Illinois College of Medicine		(1928)	81.0
University of Michigan Medical School		(1923)	85.7
Washington University School of Medicine		(1927)	84.1
Western Reserve University School of Medicine		(1925)	77.0

University of Virginia Department of Medicine	(1926)	85.0
Marquette University School of Medicine	(1925)	80.7
University of Copenhagen	(1922)†	79.4

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement with
College of Medical Evangelists		(1927)	N. B. M. Ex.

* This candidate has received a four year certificate and will receive his M.D. degree on completion of one year's internship in a hospital.
† Verification of graduation in process.

Medical Economics

THE PHYSICIAN'S INCOME TAX—1929

The taxpayer who is required to make a return must do so on or before March 15, unless an extension of time for filing the return has been granted. For cause shown, the collector of internal revenue for the district in which the taxpayer files his return may grant such an extension, on application filed with him by the taxpayer. This application must contain a full recital of the causes for the delay. Failure to make a return may subject the taxpayer to a penalty of 25 per cent of the amount of the tax due.

The normal rate of tax on individual citizens or residents of the United States, under the Revenue Act of 1928, is 1.5 per cent on the first $4,000 of net income in excess of the exemptions and credits, 3 per cent on the next $4,000, and 5 per cent on the remainder.

WHO MUST FILE RETURNS

1. Returns must be filed by every person having a *gross* income of $5,000 or more, regardless of the amount of his net income or his marital status. If the aggregate gross income of husband and wife, living together, was $5,000 or more, they must file a joint return or separate returns, regardless of the amounts of their joint or individual net incomes.

2. If *gross* income was less than $5,000, returns must be filed (*a*) by every unmarried person, and by every person married but not living with husband or wife, whose *net* income was $1,500 or more, and (*b*) by every married person, living with husband or wife, whose *net* income was $3,500 or more. If the aggregate net income of husband and wife, living together, was $3,500 or more, each may make a return or both unite in a joint return.

If the marital status of a taxpayer changed during the tax year, the amount of income necessary to bring him within the class required to make returns should be ascertained by inquiry of the local collector of internal revenue.

As a matter of courtesy only, blanks for returns are sent to taxpayers by the collectors of internal revenue, without request. Failure to receive a blank does not excuse any one from making a return; the taxpayer should obtain one from the local collector of internal revenue.

The following discussion covers matters relating specifically to the physician. Full information concerning questions of general interest may be obtained from the official return blank or from the collectors of internal revenue.

GROSS AND NET INCOMES: WHAT THEY ARE

Gross Income.—A physician's gross income is the total amount of money received by him during the year from professional work, regardless of the time when the services were rendered for which the money was paid, plus such money as he has received as profits from investments and speculation, and as compensation and profits from other sources.

Net Income.—Certain professional expenses and the expenses of carrying on any enterprise in which the physician may be engaged for gain may be subtracted as "deductions" from the gross income, to determine the net income on which the tax is to be paid. An "exemption" is allowed, the amount depending on the taxpayer's marital status during the tax year, as stated before. These matters are fully covered in the instructions on the tax return blanks.

Earned Income.—In view of the credit of 25 per cent allowed on *earned* net income, the physician should state accurately the amount of such income as distinguished from his receipts from other sources. *Earned* income means professional fees, salaries and wages received as compensation for personal services rendered. From this, in the computation of the tax, must be subtracted certain "earned income deductions." The difference is the "earned net income."

The first $5,000 of an individual's net income from all sources may be claimed, without proof, to be *earned* net income, whether it was or was not in fact *earned* within the meaning set forth in the preceding paragraph. Net income in excess of $5,000 may be claimed as *earned* if it in fact comes within that category. However, a taxpayer may not claim, as *earned*, net income in excess of $30,000.

The conditions relating to the computation of the tax on earned income are too elaborate to be stated here. In case of doubt, physicians should consult collectors of internal revenue.

DEDUCTIONS FOR PROFESSIONAL EXPENSES

A physician is entitled to deduct all current expenses necessary in carrying on his practice. The following statement shows what such deductible expenses are and how they are to be computed:

Office Rent.—Office rent is deductible. If a physician rents an office for professional purposes alone, the entire rent may be deducted. If he rents a building or apartment for use as a residence as well as for office purposes, he may deduct a part of the rental fairly proportionate to the amount of space used for professional purposes. If the physician occasionally sees a patient in his dwelling house or apartment, he may not, however, deduct any part of the rent of such house or apartment as professional expense; to entitle him to such a deduction he must have an office there, with regular office hours. If a physician owns the building in which his office is located, he cannot charge himself with "rent" and deduct the amount so charged.

Office Maintenance.—Expenditures for office maintenance, as for heating, lighting, telephone service and the services of attendants, are deductible.

Supplies.—Payments for supplies for professional use are deductible. Supplies may be fairly described as articles consumed in the using; for instance, dressings, clinical thermometers, drugs and chemicals. Professional journals may be classified as supplies, and the subscription price deducted. Amounts currently expended for books, furniture and professional instruments and equipment, "the useful life of which is short," may be deducted; but if such articles have a more or less permanent value, their purchase price is a capital expenditure and is not deductible.

Equipment.—Equipment comprises property of more or less permanent value. It may ultimately be used up, deteriorate or become obsolete, but it is not in the ordinary sense of the word "consumed in the using"; rather, it wears out.

Payments for equipment or nonexpendable property for professional use cannot be deducted. As property of this class may be named automobiles, office furniture, medical, surgical and laboratory equipment of permanent value, and instruments and appliances constituting a part of the physician's professional outfit and to be used over a considerable period of time. Books of more or less permanent value are regarded as equipment, and the purchase price is therefore not deductible.

Although payments for equipment or nonexpendable articles cannot be deducted, yet from year to year there may be charged off against them reasonable amounts as depreciation. The amounts so charged off should be sufficient only to cover the lessened value of such property through obsolescence, ordinary

wear and tear, or accidental injury. If improvement to offset obsolescence and wear and tear or injury has been made, and deduction for the cost claimed elsewhere in the return, claim should not be made for depreciation.

A hard and fast rule cannot be laid down as to the amount deductible each year as depreciation. Everything depends on the nature and extent of the property and on the use to which it is put. Five per cent a year has been suggested as a fair amount for depreciation on an ordinary medical library. Depreciation on an automobile would obviously be much greater. The proper allowance for depreciation of any property is that amount which should be set aside for the tax year in accordance with a reasonably consistent plan, not necessarily at a uniform rate, whereby the aggregate of the amounts so set aside, plus the salvage value, will at the end of the useful life of the property in the business equal the purchase price of the property or, if purchased before March, 1913, its estimated value as of that date or its original cost, whichever may be the greater. The physician must in good faith use his best judgment and make such allowance for depreciation as the facts justify. Physicians who, from year to year, claim deductions for depreciation on nonexpendable property will do well to make annual inventories, as of January 1, each year.

Medical Dues.—Dues paid to societies of a strictly professional character are deductible. Dues paid to social organizations, even though their membership is limited to physicians, are personal expenses and not deductible.

Postgraduate Study.—The Commissioner of Internal Revenue holds that the expense of postgraduate study is not deductible.

Traveling Expenses.—Traveling expenses necessary for professional visits to patients are deductible. The board of tax appeals has held that traveling expenses incurred in attending medical meetings are deductible.[1] Such expenses include only those necessarily incurred in attendance at a professional meeting for a professional purpose. The taxpayer is advised to make no claim for the deduction of such expenses unless he is prepared to establish the fact of expenditure. In the future accurate itemized records should be kept of such expenses and substantiating evidence, such as Pullman and railroad receipts, hotel bills and so on, should be carefully preserved.

AUTOMOBILES

Payment for an automobile is a payment for permanent equipment, and is not deductible. The cost of operation and repair, and loss through depreciation, are deductible. The cost of operation and repair includes the cost of gasoline, oil, tires, insurance, repairs, garage rental (when the garage is not owned by the physician), chauffeurs' wages, etc.

Deductible loss through depreciation is the actual diminution in value resulting from obsolescence and use, and from accidental injury against which the physician is not insured. If depreciation is computed on the basis of the average loss during a series of years, the series must extend over the entire estimated life of the car, not merely over the period in which the car is in the possession of the present taxpayer.

If the automobile is used for professional and also for personal purposes—as when used by the physician for recreation, or used by his family—only so much of the expense as arises out of the use for professional purposes may be deducted. A physician doing an exclusive office practice and using his car merely to go to and from his office cannot deduct depreciation or operating expenses; he is regarded as using his car for his personal convenience and not as a means of gaining a livelihood.

What has been said with respect to automobiles applies with equal force to horses and vehicles and the equipment incident to their use.

1. Cecil M. Jack v. Commissioner, 13 B. T. A. 726; J. Bentley Squier, 13 B. T. A. 1223.

MISCELLANEOUS

Laboratory Expenses.—The deductibility of the expenses of establishing and maintaining laboratories is determined by the same principles that determine the deductibility of other corresponding professional expenses. Laboratory rental and the expenses of laboratory equipment and supplies and of laboratory assistants are deductible when under corresponding circumstances they would be deductible if they related to a physician's office.

Losses by Fire, etc.—Loss of and damage to a physician's equipment by fire, theft or other cause, not compensated by insurance or otherwise recoverable, may be computed as a business expense, and is deductible, provided evidence of such loss or damage can be produced. Such loss or damage is deductible, however, only to the extent it has not been made good by repair and the cost of repair claimed as a deduction.

Insurance Premiums.—Premiums paid for insurance against professional losses are deductible. This includes insurance against damages for alleged malpractice, against liability for injuries by a physician's automobile while in use for professional purposes, and against loss from theft of professional equipment, and damage to or loss of professional equipment by fire or otherwise. Under professional equipment is to be included any automobile belonging to the physician and used for strictly professional purposes.

Expense in Defending Malpractice Suits.—Expenses incurred in the defense of a suit for malpractice are deductible as business expense. Expenses incurred in the defense of a criminal action, however, are not deductible.

Sale of Spectacles.—Oculists who furnish spectacles, etc., may charge as income money received from such sales and deduct as an expense the cost of the article sold. Entries on the physician's account books should in such cases show charges for services separate and apart from charges for spectacles, etc.

Book Notices

DIE LABYRINTHREFLEXE AUF DIE AUGENMUSKELN NACH EINSEITIGER LABYRINTHEXSTIRPATION NEBST EINER KURZEN ANGABE ÜBER DEN NERVENMECHANISMUS DER VESTIBULÄREN AUGENBEWEGUNGEN. Von Dr. R. Lorente de Nó, Assistent des „Instituto Cajal", Madrid. Paper. Price, 15 marks. Pp. 205, with 208 illustrations. Berlin: Urban & Schwarzenberg, 1928.

The author began his studies on the influence of the labyrinth on the eye muscles as an anatomist in 1921. Later, he combined histologic studies with observations of the movements of the whole eye after certain lesions of the central nervous system. Then he became acquainted with Bárány, with whom he has been working in Upsala for the last three years. His monograph represents one of the most valuable contributions to the physiology and pathology of the labyrinth that have ever been made. Only a few of his results and conclusions can be mentioned here, and any one who is really interested in the problems of nystagmus should study the book carefully. The technic that Lorente de Nó used was extirpation of one labyrinth on rabbits, and observation of the eye muscles with Bartel's method. Both eyes of the animal were destroyed, so that visual impressions and their influence on the nervous system were ruled out. The muscles of one eye were carefully prepared, and their contractions and relaxations recorded independently. With this method the spontaneous phenomena that the eye muscles show, the tonic reflexes, and the reflexes after rotary motion, were studied after extirpation of one labyrinth had been preformed. The author made small circumscribed lesions in and around the region of the vestibular nucleus with a fine cutting needle, observed the disturbances on the part of the labyrinth-eye reflexes, and studied the lesions anatomically. The final conclusions of the author, after six years of work on the labyrinth, are very cautious and reserved. The rule of reciprocal innervation of synergists and antagonists was found to hold true in every case except after certain lesions of the central nervous

system. These lesions, however, seem to be very complicated. For all the reflexes of the eye muscles due to stimulation of the labyrinth, the substantia reticularis in the pons plays the most important part. It must not be thought that there are separate centers, or parts of one center, for every labyrinth reflex, or that a certain part of the nuclear region causes nystagmus in only one direction. There is no relation of a certain part of the nucleus of the vestibular nerve to a certain eye muscle. Lesions of the substantia reticularis, made in any plane whatever, modify all reflexes to a certain extent. The quick phase of nystagmus is thought to have its neurons in the substantia reticularis too, between the motoric nucleus of the fifth and the seventh nerve.

The mechanism of the labyrinth-eye reflexes has been studied under simplified conditions. Optical impressions were excluded; the subjects were animals without voluntary eye movements. The mechanism was found to be complicated and still unknown to a great extent. It is hoped Lorente de Nó will add some experiments on another species, especially in regard to the substantia reticularis in animals with a more highly developed motility of the eye.

TUBERCULOSIS AND HOW TO COMBAT IT. A Book for the Patient. By Francis M. Pottenger, A.M., M.D., LL.D. Second edition. Cloth. Price, $2. Pp. 275. S. Louis: C. V. Mosby Company, 1928.

This manual is intended for the tuberculous patient and his friends. Sometimes the friends need instruction more than the patient. Both will profit from a reading of this book, which treats simply but thoroughly of the causation, therapy, prevention and hygiene of tuberculosis. While the author explicitly states that the work is not intended to take the place of the physician, the latter, if he treats tuberculosis only occasionally, will derive great benefit from a study of it.

STUDIES ON SCURVY. By Arthur W. Meyer and Lewis M. McCormick. Stanford University Publications. University Series. Medical Sciences, volume II, number 2. Paper. Price, $1.50. Pp. 107, with illustrations. Stanford University: Stanford University Press, 1928.

This monograph, covering the subject of experimental scurvy in the guinea-pig, is well written and replete with excellent illustrations. The contents are divided into three sections: 1. The symptomatology and gross morphology of experimental scurvy in the guinea-pig, by Arthur W. Meyer. In this chapter the new observations by the author are described in detail, later summarized and illustrated with thirteen photographs of gross specimens. 2. The minute morphology of experimental scurvy in the guinea-pig, by Arthur W. Meyer. Following a detailed description of the microscopic pathology, the section is illustrated by fifty-four reproductions of sections. 3. Some characteristics of the blood of the guinea-pig in experimental scurvy, by Lewis M. McCormick. This section is profusely illustrated with graphs, charts and three photomicrographs of blood specimens. The bibliography is complete. The book is recommended to all interested in a study of scurvy.

CONSECRATIO MEDICI AND OTHER PAPERS. By Harvey Cushing, M.D., Surgeon in Chief of the Peter Bent Brigham Hospital. Cloth. Price, $2.50 net. Pp. 276. Boston: Little, Brown & Company, 1928.

With the exception of a paper on Dr. Samuel Garth, the Kit-Cat Poet (1661-1718), written in 1904, and a magazine article on experiences in France during the war, this book is made up of addresses on various occasions, mostly during quite recent years. Consecratio medici, the opening paper, is an address to a graduating class in 1926. The other subjects are: realinements in greater medicine, 1913; William Osler, the man, 1920; the personality of a hospital, 1921; the physician and surgeon, 1922; Louisa Parsons and her medals, 1922; the "Boston tins," 1923; the clinical teacher and the curriculum, 1924; the Western Reserve and its medical traditions, 1924; experimentum periculosum, judicium difficile, 1925; the doctor and his books, 1926, and emancipators, 1927. Whatever the subject, Dr. Cushing writes most interestingly out of a rare fund of appropriate knowledge and with sound sense as well as high literary skill. Traditions and persons are presented sympathetically with an occasional touch of humor. The tribute to Lister (emancipators) is stirring. As would be expected from the biographer of Osler, the sketch of Osler the man is of unusual interest; it conveys true oslerian charm with intimate glimpses and illuminating quotations. The book merits many readers and a place on the same shelf as the Alabama Student, Aequanimitas and Confessio Medici.

SYPHILIS: ACQUIRED AND HEREDOSYPHILIS. By Charles C. Dennie, B.S., M.D., Assistant Professor of Dermatology and Syphilology, University of Kansas School of Medicine. Harper's Medical Monographs. Cloth. Price, $2.50. Pp. 304, with illustrations. New York: Harper & Brothers, 1928.

This is the first of a series of medical monographs intended to present to the busy practitioner the gist of various medical subjects. The beginning is a good one, for Dr. Dennie has succeeded in condensing into a small volume a great deal of information on an important subject. The book is beautifully printed and it is to be hoped that its presentation in so attractive a form may lead to a wider knowledge of syphilis among the members of the medical profession, for it is a subject that has long been shamefully neglected in undergraduate medical instruction. The author's style is easy and it is plain that most of his information is part of his personal experience. The emphasis put on the recognition of the primary lesion, the fact that it may be not at all ulcerated but only an innocent looking erosion, and the suggestion that the dark field illuminator is an instrument that should be in the hands of the general practitioner are most timely. A careful description of *Spirochaeta pallida* would have been an excellent accompaniment, instead of a mere drawing, which is, of course, wholly inadequate. The chapter on public health is well worded and practical. The same can be said of the whole monograph. Words are not wasted on nonessentials. For most of the diagnostic and therapeutic procedures recommended, the detailed technic is given. It is to be hoped that this book may have a wide perusal and that it may lead many to a deeper study of this most important disease.

Books Received

Books received are acknowledged in this column, and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender. Selections will be made for more extensive review in the interests of our readers and as space permits. Books listed in this department are not available for lending. Any information concerning them will be supplied on request.

THE CLINICAL EXAMINATION OF THE NERVOUS SYSTEM. By G. H. Monrad-Krohn, M.D., F.R.C.P., Professor of Medicine in the Royal Frederick University, Oslo. With a foreword by T. Grainger Stewart, M.D., F.R.C.P., Physician to the National Hospital for the Paralyzed and Epileptic, Queen Square. Fourth edition. Cloth. Price, $2.50 net. Pp. 209, with 55 illustrations. New York: Paul B. Hoeber, Inc., 1928.

New edition of brief practical outline of neurologic diagnosis.

HYDATID DISEASE: ITS PATHOLOGY, DIAGNOSIS AND TREATMENT. By Harold R. Dew, M.B., B.S., F.R.C.S., Honorary Surgeon to Out-Patients, Melbourne Hospital. Cloth. Price, 27s. 6d. net. Pp. 429, with 87 illustrations. Sydney: Australasian Medical Publishing Company, Ltd., 1928.

Monographic consideration of somewhat unusual condition.

THE BASIS OF BREEDING. By Leon F. Whitney, Executive Secretary, American Eugenics Society. Cloth. Price, $3. Pp. 260, with illustrations. New Haven, Conn.: Earle C. Fowler, 1928.

Simply stated consideration of present conceptions of heredity and eugenics.

MODERN MEDICINE: ITS THEORY AND PRACTICE IN ORIGINAL CONTRIBUTIONS BY AMERICAN AND FOREIGN AUTHORS, GENERAL INDEX. Edited by Sir William Osler, Bart., M.D., F.R.S. Re-Edited by Thomas McCrae, M.D., Professor of Medicine in the Jefferson Medical College. Assisted by Elmer H. Funk, M.D., Clinical Professor of Medicine, Jefferson Medical College. Third edition. Cloth. Price, $1 net. Pp. 126. Philadelphia: Lea & Febiger, 1928.

RELATORIO DA SECRETARIA DE SAÚDE E ASSISTENCIA PUBLICA ANNO DE 1927. Por Antonio Luis C. A. de Barros Barreto. Paper. Pp. 363, with illustrations. Bahia: Imprensa Official do Estado, 1928.

INVESTIGACIONES SOBRE LA VIRULENCIA DE LA SANGRE EN LA TUBERCULOSIS. Por el Dr. R. Pla y Armengol, director del Instituto Ravetllat-Pla. Paper. Pp. 99. Barcelona: Instituto Ravetllat-Pla, 1928.

EN CONTRA DEL CANCER. Por F. R. Peña, profesor de anatomia topografica en la Facultad de Medicina de Mejico. Paper. Pp. 31. Mexico, 1927.

ANNUAL REPORT OF THE QUEENSLAND COMMISSIONER OF PUBLIC HEALTH TO 30TH JUNE, 1928. Paper. Pp. 31. Brisbane, 1928.

Medicolegal

Opinion as to Whether Knife was Capable of Causing Death

(Yeager v. State (Texas), 3 S. W. (2d) 808)

The accused, Yeager, was convicted of an assault with intent to commit murder and appealed to the court of criminal appeals of Texas. At the trial, the prosecuting witness testified that the accused cut her with a pocket knife. The accused testified that the length of the knife with which he cut the prosecuting witness was about 1¾ inches, the blade being about three-fourths inch in length. Dr. P. testified that he dressed the wounds of the prosecuting witness; that she had three cuts, one behind the left ear extending about 7 inches and about one-fourth inch deep, and another across the side and abdomen about 6 inches long and about one-half or three-fourths inch deep. Dr. P. was asked by the state whether a knife with a blade from 1 to 2 inches long, in the hands of the accused, or a man of his size, used on a girl the size of the prosecuting witness, who weighed 118 pounds (54 Kg.), was capable of producing death. Over the objection of the accused, Dr. P. answered in the affirmative. The accused contended that the question asked Dr. P. was not the subject of expert evidence; that it did not include proof as to the nature and location of the wounds, and that what might or could be done with a weapon was not the test. The court of criminal appeals, in overruling this contention, said:

> An expert medical witness cannot give his opinion upon a matter about which the jury are as capable of judging as he is, nor upon any issue which the jury are impaneled to try. It would seem, however, that a physician familiar with human anatomy, the structure of its tissues, the depth below the surface of its vital organs, and the protection over each of them in the way of bones or muscles, is qualified and ought to be permitted to give an opinion as to whether a described instrument in the hands of a certain person is capable of producing death. Certainly this is a matter that the jury could not know about. In another form the question amounted to no more than whether or not the knife described could penetrate to a vital organ so as to cause death. Under the peculiar facts of this case this seems to have been made an issue. Certainly if the appellant was attacking with a weapon that was capable of penetrating to and severing or entering some vital organ, it was a potent circumstance against him which the jury were entitled to know, but if on the other hand the attack was made with an instrument not capable of producing death, both because of its size and the structure of the human anatomy, it would bear strongly on the issue of his lack of intent to kill.

Exception was also reserved to the refusal of the trial court to permit Dr. P. to answer a question as to whether or not the knife was used as a deadly weapon. The court of criminal appeals held that a refusal to permit an answer to this question was proper. The question, the court said, clearly called for a conclusion on the issue to be tried by the jury in view of the instruction given the jury that the intent to kill might be found from the manner in which the knife was used. The court of appeals confirmed the conviction of the accused.

Indemnity Insurance as Affecting Liability of Charitable Institution

(Williams' Adm'x v. Church Home for Females and Infirmary for Sick (Ky.), 3 S. W. (2d) 753)

The defendant home was a corporation organized and conducted for charitable purposes. The plaintiff's intestate resided in the home and paid board. While the intestate was entering an elevator in the home, the elevator was started and through the gross negligence of the operator, an employee of the home, the intestate received injuries from which she died. This action was brought by the administratrix of the intestate to recover damages for her death. The petition set forth that the defendant home carried a policy of liability insurance by the terms of which the home was protected against loss by virtue of any person receiving injuries on the elevator as a result of which death occurred. From an adverse judgment in the circuit court, the plaintiff appealed to the court of appeals of Kentucky.

This court stated that a charitable institution organized solely for the purpose of the treatment and care of the poor and sick, the income of which, whether derived from donations or from patients, is devoted exclusively to the maintenance of the institution, is exempt from liability for the torts of its agents or employees. Immunity from liability, the court said, is usually based on three grounds: 1. It is a matter of public policy. 2. The assets or funds of the institution are impressed with a trust for charitable purposes, and may not be diverted to other use. 3. Those who voluntarily enter the institution, whether as pay or as charity patients, impliedly waive all claim for injuries and assume the risk thereof. The court of appeals held that all three theories of nonliability were based on sound logic. With respect to the insurance policy, the court said that it was apparent that the contract between the insurance company and the home was one of indemnity only and that if there was no loss there could be no liability on the part of the insurance company. It was argued on behalf of the plaintiff that the mere procurement of indemnity insurance by a charitable institution was of itself sufficient to make the institution liable on the ground that no diversion of trust funds would result. The court of appeals, however, cited the opinion of the district court of appeals of California in *Levy* v. *Superior Court*, 74 Calif. App. 171, 239 P. 1100, as answering that argument. The California court said in part:

> If a liability may be created or an exemption waived by the acts of the trustee of a charity in procuring and accepting the promise of a third person to make good the losses following such liability or waiver, and the trustee thus allowed to accomplish indirectly that which is not permitted to be done directly, the protection afforded by the rule stated would be destroyed. . . . It is our opinion that the theory that a charity, not otherwise subject to liability, may become liable by reason of the procurement by those administering it of indemnity insurance cannot be supported in principle.

The court of appeals, therefore, affirmed the judgment against the plaintiff entered by the circuit court.

Conjectural Opinion as to Relation Between Accident and Disability

(McLaughlin v. Curtis Quillen Co., et al. (N. Y.), 227 N. Y. S. 712)

The claimant was injured in the course of his employment, Aug. 31, 1926, by a violent blow on the forehead, which caused a transverse fracture of the frontal bones. He suffered from pains, headaches, and tremor of the hands. The insurer paid compensation for four weeks only. The attending physician reported, October 7, that the claimant no longer needed medical or surgical attention and was able to resume work. The claimant did resume work, but at an occupation which paid lower wages, because he claimed that he had dizzy spells and headaches and was nervous and unable to work at his usual vocation. He attributed his condition to the former injury. The state industrial board made an award for the reduced earnings from Oct. 6, 1926, to March 9, 1927. An appeal from the award was taken to the supreme court of New York, appellate division, third department, on the ground that no causal connection was shown between the injury and the reduced earning power. The testimony showed that the claimant was 62 years of age at the time of the injury; that the ailments might have been due to drinking; that the injury was not sufficiently serious to produce the consequences claimed; that the symptoms were practically all subjective, and that the claims concerning them were somewhat vague and indefinite. From this testimony the court resolved that the question required the aid of medical skill, and the only medical evidence was that of a Dr. L., who first examined the claimant, March 8, 1927. The physical examination disclosed nothing objective except a distinct tremor of the upper extremities. Dr. L. stated that the injury could have been a contributing factor to the headache and vertigo of which the claimant complained. The court held that while the modern rule relative to opinion evidence was liberal, in doubtful cases there must be more than possibility of result, if weight and credit were to be given the opinion of a medical expert. While no special form of words is required in framing the question, the answer must disclose that in the mind of the witness there exists a reasonable certainty that a given condition or result has occurred from the original injury. The opinion of Dr. L., the court thought, fell short of a definite opinion on the vital issue of causation. It was essentially speculative and conjectural. The question to be determined was not whether one of several possible causes could contribute to the existing physical condition, but what actually in all

probability did cause it. If there had been other evidence pointing strongly toward the claimed grounds of causation, the court could overlook the deficiency in the expert's evidence. But the probative value of the testimony was so slight that it did not possess sufficient weight to establish the necessary relation between the injury and the claimed disability. The award was therefore reversed and the matter remitted to the state industrial board.

Result of Accident in Doubt: Notice Requirement

(Beeler v. Continental Casualty Company (Kan.), 265 Pac. 57)

The defendant insurance company issued a policy of accident insurance to the plaintiff which provided that written notice should be given the insurance company within twenty days after an accident, unless it was shown that it was not reasonably possible to give such notice and that notice was given as soon as it was reasonably possible. May 8, 1922, the plaintiff fell and struck his back but continued working until May 29, when he became ill. He was treated by various physicians for biliousness, malaria and infected tonsils, without perceptible improvement. Finally, the malady from which the plaintiff was suffering was discovered to be due to misplaced vertebrae, which the plaintiff then concluded was the result of the accident. He then, Oct. 10, 1923, sixteen months after the accident, gave written notice to the defendant company. Until that notice was given, the plaintiff had not attributed his condition to the accident. The district court awarded a judgment in favor of the plaintiff. The defendant appealed, contending that the terms of the policy concerning notice had not been complied with. The supreme court of Kansas in affirming the judgment of the district court held that the plaintiff had complied with the provisions of the policy by giving written notice to the defendant as soon as he learned that he had been injured by the accident. The supreme court was unable to perceive wherein the defendant was in any way prejudiced by the delayed notice.

Injury Presumed to Be Accidental

(International Travelers' Assn. v. Bettis (Texas), 3 S. W. (2d) 478)

The deceased died of septicemia resulting from an infection in a wound on his finger. He held an accident policy insuring him against death resulting from "bodily injuries, affected directly, independently and exclusively of all other causes through accidental means." The policy further provided that "blood poisoning or septicemia resulting directly from bodily injuries shall be deemed to be included in the said term, 'bodily injuries.'"

The appellee, Bettis, as administrator brought suit on the policy and recovered judgment in the district court. The insurance company appealed to the court of civil appeals of Texas, contending, among other things, that the policy did not insure against accidental death but against death from injuries effected by accidental means, and that, since there was no evidence showing that the insured's death was due to injuries caused by accidental means, the judgment of the district court was in error. The court of appeals said that the evidence clearly established that blood poisoning developed from the particular wound on the finger of the insured and that the question presented was whether the injury or wound was effected directly through accidental means. The court said that, under the admitted and uncontroverted facts, the immediate cause of the death was blood poisoning and that it arose from a visible flesh wound caused by violence from some external force. At this point, the court said, in the absence of any proof to the contrary, the law presumes that the insured did not intentionally or voluntarily inflict such injury on himself. The court held, therefore, that the jury could have reached no other conclusion than that the injury was caused by accidental means, since the insurance company introduced no evidence in the case tending to show that the injury was self-inflicted.

It was further contended by the appellant insurance company that the deceased was not "totally and continuously disabled from the date of the accident." The court said that there was no merit in this contention. The policy required disability from "the date of accident," and expressly made blood poisoning an accident within the terms of the policy. The date of accident, the court said, was fixed by and from the time the blood poisoning developed and not from the date of the cut on the finger of the insured. It was uncontroverted that the insured was disabled after the blood poisoning developed.

The court of appeals could not find a reversible error in record and affirmed the judgment of the district court.

Cerebral Paralysis and Testamentary Capacity

(In re Gardiner's Will, 227 N. Y. S. 550)

In contesting the probating of the will of Margaret Gardiner, the contestant contended that the testatrix was not of sound and disposing mind at the time of the execution of the will, in May, 1921.

The contestant introduced testimony that in 1919 the testatrix was treated for cerebral paralysis. The attending physician testified that one side was paralyzed, the arm, the leg, and the face were drawn; the patient was unable to speak and had to be put to bed, where she remained for about a month. The attending physician further testified that in May, 1921, he did not recollect any particular thing that indicated irrationality but that at various times during 1919, 1920 and 1921, during which time he made professional calls on her regularly, the testatrix performed certain acts which he thought irrational; that is, the testatrix at one time did not notice that her house was full of gas, did not notice that she was dirty and unclean, and said at one time that there was no meat in the house when there was salt pork in the cellar.

The surrogate's court, Schoharie County, New York, allowed the will to be probated. In discussing the effect of cerebral paralysis on testamentary capacity the court said:

> It is common knowledge that people who have had a "shock" recover from it and go about their ordinary work one or two months after the occurrence. They may not have the full use of their limbs but they may have an intelligent understanding of all the relations of life and normally conduct themselves.

The court thought that to take detached isolated remarks, separated from their context and the circumstances under which they were uttered, over a period of two or three years, and base on them the conclusion that a person is incompetent to make a will, is unreasonable.

Disease Resulting from Injury Compensable

(Industrial Commission v. Rice (Ohio), 160 N. E. 484)

The defendant in error, Rice, in the course of his employment became accidentally trapped in a furnace for several minutes and as a result of breathing the fumes and gas became physically incapacitated. Prior to the accident he had been in good health. Tuberculosis later developed which, according to the report of one attending physician, was probably caused by the fumes and gas. Two other physicians reported that the disability was "due entirely to this injury." A proceeding was instituted by the defendant in error under the workmen's compensation act to recover for the injuries. A decision of the industrial commission disallowing the claim was reversed by the court of common pleas and the industrial commission brought error to the court of appeals of Ohio, Erie County. In affirming the judgment of the court of common pleas, the court of appeals held that disease directly resulting from an injury sustained in the course of employment is not an occupational disease but is compensable on the theory that the condition is caused by the injury. While there was some evidence to the contrary, the court of appeals thought that the court of common pleas was warranted in finding that the incapacity to work and the tuberculosis resulted directly from injury caused by inhaling the injurious substances.

Society Proceedings

COMING MEETINGS

Pacific Coast Surgical Association, Catalina Island, California, February 22-23. Dr. E. L. Gilcreest, Fitzhugh Building, Union Square, San Francisco, Secretary.

Tri-States Medical Association of Mississippi, Arkansas and Tennessee, Memphis, February 6-8. Dr. A. F. Cooper, Bank of Commerce Bldg., Memphis, Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American J. Medical Sciences, Philadelphia

176: 617-760 (Nov.) 1928

*Renal Lesion in Bright's Disease. T. Addis, San Francisco.—p. 617.
*Renal Function in Arterial Hypertension. R. H. Major, Kansas City, Kan.—p. 637.
Acute Mercurial Intoxication: Thirty-Eight Cases. S. Goldblatt, Cincinnati.—p. 645.
*Raynaud's Disease Associated with Cancer of Stomach. T. I. Bennett and E. P. Poulton, London.—p. 654.
*Spontaneous Nontuberculous Pneumothorax in Infancy and Childhood. E. G. Stoloff, New York.—p. 657.
*Clinical Significance of Life Cycle of Parasite in Induced Malaria. N. Kopeloff and C. O. Fiertz, New York.—p. 664.
*Accessory Spleens: Significance in Essential Thrombocytopenic Purpura Hemorrhagica. M. Morrison, M. Lederer and W. Z. Fradkin, New York.—p. 672.
*Gastric Polyposis. A. A. Strauss, J. Meyer and A. Bloom, Chicago.—p. 681.
*Differential Diagnosis of Surgical from Nonsurgical Jaundice by Laboratory Methods. L. W. Johnson and P. F. Dickens, Washington, D. C.—p. 690.
*Effect of Iodine on Experimental Hyperthyroidism in Man. D. A. Carson and W. Dock, San Francisco.—p. 701.
Insulin Hypersensitiveness: Immunologic Consideration and Case Reports. L. Tuft, Philadelphia.—p. 707.
Fibrolipoma of Left Main Bronchus Removed Through Bronchoscope. M. C. Myerson, New York.—p. 720.

Renal Lesion in Chronic Interstitial Nephritis.—Addis states that by a study of the urine, patients with chronic interstitial nephritis may be divided into three groups to which the names arteriosclerotic, degenerative and hemorrhagic have been provisionally attached. From the seventy-five instances in which the urinary observations were compared with the renal lesion as it existed at the moment of death, he has found that the arteriosclerotic group are characterized by an arteriosclerosis of the renal arteries and by a patchy fibrosis of the cortex; that the degenerative group show granular, fatty or necrotic changes in the tubule cells, while the hemorrhagic group are distinguished by the presence of inflammatory lesions in the glomeruli. As a result, a classification which was at first only a summary statement of the observation that some kidneys bled, others excreted an excess of degenerated cells, and still others neither bled nor desquamated cells, begins to acquire an anatomic significance. The evidence at hand indicates that bleeding means an active glomerular inflammation; that an increased excretion of epithelial cells means tubular degeneration, and that a continuing slight excess of casts and protein and cells in the urine may mean a renal arteriosclerosis. The observations, then, tend toward the conclusion that the hemorrhagic cases through all their diverse stages are one disease, the arteriosclerotic cases are another and separate disease, and the degenerative group represent renal effects of many different diseases.

Renal Function in Arterial Hypertension.—The results of Major's observations indicate that many hypertensive patients belonging to the group with essential hypertension do not, as commonly stated, have a normal kidney function. They are unable to excrete normally two guanidine compounds, methylguanidine and methylguanidine acetic acid anhydride (creatinine). This evidence indicates a frequent abnormality of kidney function in arterial hypertension.

Raynaud's Disease Associated with Gastric Cancer.—A case of Raynaud's disease with symmetrical gangrene of the fingers of both hands is reported by Bennett and Poulton. Postmortem examination revealed carcinoma of the stomach with secondary carcinoma cells in the inferior cervical ganglion. The presence of these cells in the ganglion were considered to be the cause of the Raynaud's disease.

Spontaneous Nontuberculous Pneumothorax in Children.—Stoloff reviewed the literature from 1844 to the present date and found eighty-four cases of spontaneous pneumothorax of nontuberculous etiology. Tuberculous disease is probably the most frequent single cause. Pneumonia follows with a 35.7 per cent incidence in this tabulation; then emphysema and gangrene. Expressed pathogenetically, pneumothorax may be caused by (*a*) degeneration in the lung (abscess, gangrene, bronchiectasis, infarction, empyema) or (*b*) rupture of the lung due to congenital defect, emphysema or foreign body. Three cases of nontuberculous spontaneous pneumothorax are added to the literature: all were postpneumonic and simple (uncomplicated), and the recoveries were uneventful. The recognition was made on the basis of roentgenography; they were characterized by a sparsity of clinical manifestations and signs which probably would not have sufficed to warrant the diagnosis in the absence of the roentgenograms and fluoroscopy.

Life Cycle of Parasite in Induced Malaria.—More than 300 patients with general paralysis have been inoculated by Kopeloff and Fiertz with a single strain of malaria which has been therapeutically effective. A detailed microscopic study of the life cycle of this parasite has been made by examining blood smears taken hourly from four patients at the present time and from three patients inoculated with malaria about three years ago. The significant finding was the total absence of gametocytes (the sexual forms of the malarial parasite). The asexual cycle of this strain of malaria is identical with the asexual cycle of "natural" (mosquito) malaria. A malarial strain free from gametocytes is of considerable practical value in the treatment of general paralysis in that: (*a*) it eliminates the possibility of the transmission of malaria to other members of the community; (*b*) it precludes the occurrence of malarial relapse following adequate quinine administration.

Significance of Accessory Spleens.—A hitherto unstressed feature is presented by Morrison et al. which may be the reason for the general failure of splenectomy in the presence of unnoticed or, if noted, unmolested, accessory splenic bodies. Such accessory splenic structures may undergo compensatory hypertrophy and gradually assume the pathic functions of the primary spleen. Two cases are presented which exemplify thrombocytopenia without accessory spleens and thrombocytopenia with accessory spleens.

Gastric Polyposis.—Strauss et al. report two cases of gastric polyposis, polyadenoma en nappe, thus increasing the number reported to seven. The clinical picture of gastric polyposis, while not definitely characteristic, is suggested by the story of a chronic gastric discomfort, repeated gastric hemorrhages, achylia gastrica, increased or normal gastric motility, abnormal amounts of gastric mucus of egg-white consistency, the general appearance of well being and a characteristic mottling of the gastric roentgenogram. Where the extent of involvement permits, gastric resection after the manner of the Polya resection is advised.

Differential Diagnosis of Jaundice.—Johnson and Dickens believe that the laboratory will give material aid in differentiating operable conditions from malignant disease of the liver and that it will help the surgeon in postoperative treatment. It is recommended that, in all operative procedures on the liver, the preoperative and postoperative treatment include the administration of dextrose and sodium chloride. It has been shown that cholemia and tetany may be controlled by the adequate administration of these substances.

Effect of Iodine on Experimental Hyperthyroidism.—A state of artificial hyperthyroidism was produced by Carson and Dock in four adult males by the feeding of thyroid extract. Iodine had no effect on this pathologic condition. The results suggest that the therapeutic effect of the iodine in hyperthyroidism is produced by its action on the thyroid epithelium.

American J. Pathology, Boston

4: 507-672 (Nov.) 1928

Primary Malignant Hemangioma of Spleen with Multiple Liver Metastases. A. W. Wright, Nashville, Tenn.—p. 507.
Chemical Contrasts Between Collagenous and Reticular Connective Tissue. N. C. Foot, Cincinnati.—p. 525.
Studies in Acromegaly: VII. Microscopic Structure of Adenomas in Acromegalic Dyspituitarism (Fugitive Acromegaly). P. Bailey and H. Cushing, Boston.—p. 545.

*Experimental Subcutaneous Rheumatic Nodules. B. J. Clawson, Minneapolis.—p. 565.
*Experimental Glomerulonephritis Produced by Intrarenal Tuberculin Reactions. E. R. Long and L. L. Finner, Chicago.—p. 571.
Phagocytic Activity of Vascular Endothelium of Granulation Tissue. F. A. McJunkin, Chicago.—p. 587.
Primary Carcinoma of Liver: Two Cases in Cattle. W. H. Feldman, Rochester, Minn.—p. 593.
Effect of Feeding Potassium Iodide on Proliferative Activity of Thyroid Gland in Guinea-Pigs. J. Rabinovitch, St. Louis.—p. 601.

Experimental Subcutaneous Rheumatic Nodules.—Clawson has demonstrated that, by injecting streptococci into the subcutaneous tissues of rabbits, lesions can be produced which are morphologically similar to the nodules found in the subcutaneous tissue in cases of acute rheumatic fever. Since these experimental nodules occur obviously as a result of injecting streptococci, the probable conclusion is suggested that acute rheumatic fever and the type of inflammation associated with it are of streptococcic origin.

Experimental Glomerulonephritis.—Experiments made by Long and Finner demonstrate that, by the injection of tuberculin into the kidneys of swine made sensitive to this substance by the presence of a mild tuberculosis, it is possible to produce a diffuse inflammation of the kidneys that may properly be considered an acute glomerulonephritis. Moreover, this effect is the result of a true tuberculin reaction, as it does not occur following the perfusion of the kidney of a nontuberculous animal with tuberculin. Therefore, the intrarenal tuberculin reaction may be added to the intradermic, conjunctival, intratesticular and other anatomic varieties of tuberculin reaction previously described.

Am. J. Roentgenol. & Radium Therapy, New York

20: 405-504 (Nov.) 1928

*Nonmalignant Tumors of Duodenum. R. Golden, New York.—p. 405.
*Roentgen Findings in Neuroblastoma. C. B. Henle, New York.—p. 414.
*Collapse of Lung in Pulmonary Tuberculosis. J. Sproull, Haverhill, Mass.—p. 419.
Roentgenologic Diagnosis of Diaphragmatic Hernia. L. T. LeWald, New York.—p. 423.
Hysterosalpingography: Diagnosis of Ectopic Pregnancy. M. P. Rucker and L. J. Whitehead, Richmond, Va.—p. 431.
Roentgen Studies of Bones in Certain Diseases of Blood and Hematopoietic System. R. G. Karshner, Los Angeles.—p. 433.
Osseous Changes in Hemolytic Icterus: Four Cases. L. J. Friedman, New York.—p. 440.
Technical Methods of Radium Application in Rectal Cancer. G. E. Binkley, New York.—p. 445.
Roentgen Therapy of Malignant Neoplasms in Mouth. J. D. Morgan, Philadelphia.—p. 452.
*Treatment of Malignant Neoplasms with Colloidal Lead. D. S. Pulford and J. D. Lawson, Woodland, Calif.—p. 456.
Vertical Roentgenographic Unit: Roentgen Examination of Head and Other Parts of Body in Upright Position. S. Israel, Houston, Texas.—p. 481.

Nonmalignant Tumors of Duodenum.—Golden reviews seventeen cases of nonmalignant tumors of the duodenum recorded in the literature and reports two new cases of polyp. The tumors include six adenomas composed of mucous cells; five adenomas composed of Brunner's glands; three myomas, two of which were ulcerated; one calcified fibromyoma; one fibro-adenoma, the character of the cells not mentioned; one growth composed of fibrous tissue and blood vessels covered by glandular epithelium and termed adenoma; one hemangioma, and one lymphangio-endothelioma. Surgical removal of the tumors in the two cases reported was followed by relief of gastric symptoms.

Neuroblastoma with Metastases.—Two cases of neuroblastoma are described by Henle; one with the primary tumor in the suprarenal, and one which was primary in the paravertebral ganglions. Both showed metastases to the bones and soft parts; each showed a striking cranial roentgenogram that had several points in common: In each the coronal suture was gaping widely, probably evidence of increased intracranial pressure secondary to brain metastases. One of the cases illustrates an observation that has previously been made; namely, that neuroblastoma of the suprarenal is associated with involvement of the orbit of the same side. If both orbits are affected, the more extensive involvement is found on the side of the primary tumor.

Collapse of Tuberculous Lung.—A case is reported by Sproull showing pulmonary tuberculosis in an adult, with collapse of first the lower lobe of the right lung, and later the upper lobe of the same lung; and this collapse was definitely proved to be due to a main stem bronchostenosis. The roentgen observations in two other cases of adult pulmonary tuberculosis are also presented; they were those characteristic of pulmonary collapse due to bronchostenosis.

Colloidal Lead Therapy of Malignant Tumors.—Of eleven patients with malignant disease treated by Pulford and Lawson with colloidal tri-ortho lead phosphate intravenously, nine are dead and in the other two the condition is unarrested. Two of them showed definite signs of tumor regression before death. The preparation used is nontoxic if employed in single doses up to 100 mg., but dangerous in its cumulative effect. It is the author's opinion that a safe dosage is 50 mg. every second or third day up to 200 mg., further injections being judged safe or not by the degree of basophilic stippling of the red blood cells. However, 100 mg. doses given at weekly intervals up to 500 mg. have not proved harmful. Consequently, from 1 to 1.5 mg. per kilogram of body weight may be considered a safe range. Very little anemia was caused by this solution of lead and no serious kidney injury was noted. The bromsulphalein liver function test did not give evidence of liver injury.

American Review of Tuberculosis, Baltimore

13: 523-726 (Nov.) 1928

Climate in Treatment of Pulmonary Tuberculosis. J. A. Miller, New York.—p. 523.
Indications for Thoracoplasty. K. Fischel, Los Angeles.—p. 551.
Parenteral Quinine Therapy: Effect in Pulmonary Tuberculosis. H. F. Newton, Boston, and K. Heine, Hamburg, Germany.—p. 563.
What is Clinical Tuberculosis? F. M. Pottenger, Los Angeles.—p. 570.
Exudative and Proliferative Processes Not Basis for Classifying Tuberculosis into Types, but Represent Different Phases of Allergic Reaction. F. M. Pottenger, Los Angeles.—p. 580.
Roentgen Evidences of Allergy and Clinical Phthisiogenesis. I. Rapaport New York.—p. 590.
Fate of Tuberculous Cavity: Anatomic, Biologic and Clinical Study. F. Baum, Newark, N. J., S. Mebel and A. Kane, Bedford Hills, N. Y.—p. 596.
*Epinephrine Reaction in Tuberculosis Patients. W. F. Petersen and S. A. Levinson, Chicago.—p. 616.
*Composite Curves of Cardiovascular Reactions Following Epinephrine Injections in Tuberculosis Patients. G. E. DeTrana and J. G. Hillebrand, Chicago.—p. 626.
Regeneration of Acid-Fastness in Apparently Degenerated Tubercle Bacilli. H. C. Sweany, Chicago.—p. 630.
*Cultivation of Tubercle Bacillus. H. C. Sweany and M. Evanoff, Chicago.—p. 661.
Fate of Tubercle Bacilli in Various Organs. H. J. Corper and N. Uyei, Denver.—p. 672.
Tuberculosis Mortality in Original Death Registration States: Death Rates from 1900 to 1924 and Influence of Certain Factors on Them. C. E. Gray, Salisbury, N. C.—p. 687.

Epinephrine Reaction in Tuberculosis.—The analysis of the epinephrine test made by Petersen and Levinson in eighty-one tuberculous individuals indicates that there is some relation between the type of reaction and the weight curve. A larger proportion of the patients showing a sympatheticotonic type of reaction occurs in the groups that are gaining in weight. Independently of the anatomic classification, both in the healed parenchymal types, as well as in individuals showing great chronicity, there is, as a rule, a normal or increased sympatheticotonic type of reaction.

Cardiovascular Reactions Following Epinephrine Injections.—Composite blood pressure curves of patients with tuberculosis made by DeTrana and Hillebrand, following subcutaneous injections of 0.5 cc. of 1:1,000 epinephrine, indicate that: 1. Minimal, moderately advanced and far advanced cases, in general, show vagotonic reactions. 2. Recovery from the effect takes place within an hour in the minimal and moderately advanced cases, while the far advanced cases show a prolonged effect. 3. The pulse rate in the minimal cases is affected least, and in the moderately advanced group, most. The far advanced cases show a primary slowing of the rate (vagotonic). 4. The curves of the cardiac output are not characteristic. On the basis of the weight curves, it was found that patients who are gaining have a primary sympatheticotonic reaction; the systolic blood pressure of the stationary and losing groups remains level or diminishes, and the pulse rate of the losing group shows the greatest increase.

Cultivation of Tubercle Bacillus.—Two culture mediums for growing tubercle bacilli are recommended for use by Sweany and Evanoff. One consists of veal-egg medium, in which the veal is leached with sterile milk instead of water, as in the Petroff method, and the other is like the first, except that 10 per cent sterile cream is substituted for glycerin. More than 90 per cent of positive results were obtained consistently by these methods with less than 15 per cent of contaminations. The cream medium is especially good for growing the bovine tubercle bacillus. In comparing these mediums with animal inoculation, in which a series of twenty-four specimens, negative by direct smear, were used, it was found that ten of them were negative by all methods and were ultimately declared so clinically. In fourteen others, 85.7 per cent were positive by culture, while 72.8 per cent were positive by animal inoculation. Although one animal was positive with contaminated culture, three cultures grew from specimens that were negative on inoculation into guinea-pigs.

Archives of Internal Medicine, Chicago

42: 611-800 (Nov.) 1928

*Xanthomatosis and Reticulo-Endothelial System: Correlation of Unidentified Group of Cases Described as Defects in Membranous Bones, Exophthalmos and Diabetes Insipidus (Christian's Syndrome). R. S. Rowland, Detroit.—p. 611.
*Synovial Fluid in Chronic Arthritis. C. E. Forkner, New York, A. R. Shands, Washington, D. C., and M. A. Poston, Baltimore.—p. 675.
Roentgen Therapy of Hypophysis in Patient with Acromegaly: Effect on Dextrose Tolerance. R. E. Allen and H. Lisser, San Francisco.—p. 703.
Syphilis of Stomach: Certain Diagnostic Criteria. H. A. Singer and F. G. Dyas, Chicago.—p. 718.
Simultaneous Nonsurgical Drainage of Gallbladder and Intravenous Cholecystography. H. L. Bockus and J. Gershon-Cohen, Philadelphia.—p. 735.
Experimental Obstructive Jaundice: III. Age Factor in Production of Bradycardia. W. C. Buchbinder, Chicago.—p. 743.
Secretin Not Hematopoietic Stimulant. J. T. King, Minneapolis.—p. 762.
New Clinical Test for Tissue Thirst. W. A. Thomas and E. Andrews, Chicago.—p. 776.
*Does Commercial Insulin Contain What Has Hitherto Been Called Vitamin B? C. J. Stucky, New Haven, Conn.—p. 780.
*Skin Sensitivity of Rheumatic Subjects to Streptococcus Filtrates: Relationship to Rheumatic Fever. E. I. M. Irvine-Jones, St. Louis.—p. 784.

Xanthomatosis and Reticulo-Endothelial System.—Two new cases of the striking syndrome "defects in membranous bones, exophthalmos and diabetes insipidus," one in which a study was made at necropsy, the other in which the patient is still under clinical observation and shows a remarkable improvement in the general condition, are reported by Rowland and discussed with twelve other cases collected from the literature. These fourteen cases, all occurring in early childhood, have been brought into relationship with other similar cases already recognized as xanthoma. All these cases represent a form of generalized visceral xanthoma-xanthomatosis in which many parts of the reticulo-endothelial system show lipoid storage or lipoid cell hyperplasia. This occurs as a diffuse process in the interstitial cells of various organs, especially the lungs, liver, lymph nodes, bone marrow and spleen, as well as in hyperplastic nodules arising from the areolar tissue, particularly of the dura, periosteum, pleura and peritoneum. This pathologic change, diffuse and nodular, is regarded as the manifestation of a disturbance of lipoid metabolism.

Synovial Fluid in Chronic Arthritis.—Bacteriologic and cytologic studies of the synovial fluids in sixty-three cases of chronic, nonsyphilitic and nontuberculous arthritis are reported by Forkner et al. The results of lymph node cultures in twenty-one of these cases are recorded. Positive cultures were obtained from the joint fluid in 22 per cent of the total number of cases. Positive growths were obtained in 48 per cent of the lymph nodes of which cultures were taken. Increased white cell counts in the synovial fluid were found in all cases. The average white cell count in the synovial fluid in the bacteriologically positive cases was approximately double that in the negative cases. The number of polymorphonuclear neutrophils was distinctly higher in the group in which positive cultures were obtained in the joint fluid. The number of monocytes and lymphocytes was definitely higher in the group in which negative cultures were obtained in the joint fluid. Synovial mesothelial cells are not a constant observation in arthritic joint fluid. Case reports are given of patients with positive bacteriologic cultures of synovial fluid and lymph nodes.

Vitamin B Content of Commercial Insulin.—A commercial insulin preparation was tested by Stucky for its vitamin B content in a group of young albino rats. From the results of the feeding trials, it may be concluded that such material, when added to a diet deficient in vitamin B, will not support growth. Tests made with pigeons suggest that the antineuritic factor also is absent. Whether the heat-stable growth promoting factor, in what has hitherto been spoken of as vitamin B, is absent was not determined.

Skin Sensitivity to Streptococcus Filtrates in Rheumatic Subjects.—Observations reported on by Irvine-Jones indicate a definite relationship between rheumatic fever and streptococcal infections, but do not implicate any particular strain of organism. It is suggested that the rheumatic syndrome is an allergic response of certain predisposed persons to the common streptococci of the upper respiratory tract.

Archives of Physical Therapy, X-Ray, Radium, Omaha

9: 475-522 (Nov.) 1928

New Growths of Chest Wall, Pleura and Lungs. A. F. Tyler, Omaha.—p. 475.
Electrocoagulation of Tonsils. G. A. Dillinger, Pittsburgh.—p. 480.
Treatment of Carbuncle with High Frequency Current. A. D. Willmoth, Louisville, Ky.—p. 486.
Use of Radium in Urology. L. C. Dubois, Chicago.—p. 491.
Use of Sinusoidal Currents in Constipation. F. H. Morse, Boston.—p. 496.
*Medical Diathermy. F. Nagelschmidt, Berlin.—p. 499.
*Secondary Anemia: Treatment. J. Jongewaard, Ames, Iowa.—p. 504.

Medical Diathermy.—Nagelschmidt sees in diathermy an agent that can be applied with good results to all organs in which glands sometimes lose their function. One can influence not only the salivary and sweat glands but also parenchymatous organs, such as the liver, the pancreas, the spleen, the kidneys and the thyroid. He describes its use in the treatment of arteriosclerosis, angina pectoris, asthma, pneumonia, pleuritis and nephritis. He says that the application of diathermy to a kidney in a state of chronic inflammation means practically the same as decapsulation. The decapsulation of the kidney means nothing less than relieving the kidney of an enormous pressure, to produce a relatively normal circulation. Diathermy application from the outside is all that is necessary to produce the same effect as a decapsulation, decongest the organ, and reproduce a good healthy arterial circulation. He testified to its beneficial effect on the pancreas in diabetes, or in thyroid treatment for myxedema or for hypothyroidism, and to its value when too little epinephrine is produced, as in the treatment of the suprarenal glands.

Treatment of Secondary Anemia with Ultraviolet Ray.—Jongewaard has had good results in these cases from the use of the ultraviolet ray. He has also given iron intravenously, but the results were not satisfactory and did not warrant continuing the treatments. The forms of iron used were iron arsenite, iron citrate and iron cacodylate. Diets in which liver was the principal feature were served three times a day, together with other foods rich in iron, and high in calories, to try to raise the hemoglobin. These patients had all been under the quartz lamp treatment, and were practically the only ones of thirty-six who did not make some stable gain. Every patient has since made a definite gain.

Arkansas M. Society Journal, Little Rock

25: 115-136 (Nov.) 1928

Treatment of Acute Retention of Urine in Male. J. W. Butts, Helena.—p. 115.
Renal Infections Complicating Pregnancy. H. F. H. Jones, Little Rock.—p. 117.
Malaria. S. J. McGraw, El Dorado.—p. 121.

Canadian M. Association Journal, Montreal

19: 519-648 (Nov.) 1928

Duty of Physician in Presence of Eclampsia. C. Jeannin, Paris.—p. 519.
*Value of Periodic Health Examinations. A. G. Fleming, Montreal.—p. 522.
Smallpox Vaccination. R. D. Defries and N. E. McKinnon, Toronto.—p. 525.
*Periarteritis Nodosa. G. F. Strong, Vancouver, B. C.—p. 534.
*Pernicious Anemia. E. S. Mills, Montreal.—p. 546.
Postoperative Accident. G. H. Murphy, Halifax, N. S.—p. 551.
Complement Fixation Test, Means of Finding Carriers of Disease. A. M. Forbes, Montreal.—p. 553.

*Nephrosis in Children. G. L. Boyd, Toronto.—p. 555.
*Calcium and Phosphorus Concentration in Intestinal Contents of Rats in Relation to Rickets. A. M. Courtney, F. F. Tisdall and A. Brown, Toronto.—p. 559.
Constipation: Cause and Correction. N. A. Page, Toronto.—p. 562.
*Lead Poisoning in Bronze Foundries. F. G. Pedley and G. Sproule, Montreal.—p. 566.
What is Pediatrist? F. M. Fry, Montreal.—p. 572.
Pernicious Vomiting of Pregnancy: Autopsy. S. Kobrinsky, Winnipeg, Man.—p. 574.
Rat-Bite Fever: Case. R. C. Stewart, Montreal.—p. 575.
Early Premature Labor with Survival of Baby. W. J. Stevens, Ottawa. —p. 577.
Treatment of Varicose Veins by Injection. L. H. McKim, Montreal. —p. 578.
Evolution of Clinical Medicine and Surgery in Relation to Preservation of Health and Life. F. H. Martin, Chicago.—p. 589.
Montreal Health Survey. A. G. Fleming, Montreal.—p. 596.
Health Districts. M. M. Seymour, Regina, Sask.—p. 598.
Workmen's Compensation Act of Province of Quebec. F. J. Tees, Montreal.—p. 599.
Early Canadian Biologist: Michel Sarrazin (1659-1735): His Life and Times. M. E. Abbott, Montreal.—p. 600.

Family Physician to Make Periodic Health Examinations.—Fleming feels that the family physician, because of his knowledge of economic, social and home conditions, and because confidence is reposed in him, is the best qualified for making periodic health examinations.

Periarteritis Nodosa.—Strong reports a case of periarteritis nodosa in a woman, aged 46. The disease was of long duration, subfebrile, and characterized by intermittent abdominal pain, progressive weakness, and peripheral neuritis of the upper extremities. Subcutaneous periarteritic nodules occurred, one of which was excised. The diagnosis was not made at that time, but was established only after study of the microscopic sections taken at autopsy. There were no other gross evidences of nodular arterial disease. The eosinophilia, up to 79 per cent, was unusual. This case does not throw any definite light on the etiology of periarteritis nodosa. The most likely possibility seems to be a rheumatic infection, with the changes either the result of the invasion of the causative organism (streptococcus?) or the result of a hyperergy to such an organism, in this disease the hyperergy being manifest in certain areas of the arterial system.

Value of Liver Diet in Pernicious Anemia.—Of twenty-five patients reported on by Mills who took the liver diet or extract, under constant supervision, twenty-two are now well after periods varying from one to three years. Two died as a result of progressive cord changes. One refused to take adequate amounts of the liver, and now shows rapidly advancing cord lesions, though the blood picture has improved somewhat.

Nephrosis in Children.—Boyd summarizes the significant laboratory observations in nephrosis. The characteristic changes in the urine are the large amount and the unusual nature of the protein it contains; the absence of gross hematuria, and the presence of large numbers of casts and frequently of white blood cells and of a doubly refractile body. The distinctive observations in the blood are its low protein content; altered albumin-globulin ratio; lowered surface tension; more or less lipemia, especially cholesterolemia, and the practical absence of any evidence of nitrogen retention. Serous effusions present suggestive evidence of the presence of the disease by their turbidity, low protein and salt content, and increased fat. The blood pressure in uncomplicated cases is always normal or low. The basal metabolism is depressed. The concentration test is the only one of the functional tests that gives any reliable aid in the making of a prognosis.

Relation of Intestinal Contents to Rickets.—The total calcium content of the cecum of rats fed on McCollum's rachitogenic diet and kept inside was much higher than that of rats fed the same diet and exposed to sunshine. The calcium bound with phosphorus was essentially the same in the cecum of the two groups of rats fed on the rachitogenic diet. The difference in the calcium concentration in the cecum in these two groups is thus due to calcium not bound with phosphorus. No essential difference was found in the phosphorus concentration in the large intestines of the two groups of rats fed on the rachitogenic diet. Courtney et al. conclude that these observations suggest that the calcium absorption or excretion in relation to rickets may not be so intimately associated with the phosphorus as is generally considered.

Lead Poisoning in Bronze Foundries.—Ten cases of lead poisoning which occurred among bronze founders are reported by Pedley and Sproule. It is not universally known that bronze frequently contains lead, sometimes in large amounts, and that in the melting operation a very high temperature is reached, high enough to cause considerable volatilization. They determine the volatility of lead from bronze at the temperature at which it is treated for casting (2100 F.), and find that it is in the neighborhood of 0.020 Gm. per square inch of molten surface a minute. Calculations are given as to how much lead is probably volatilized during the operation of pouring the metal into molds, and suggestions are made as to how this lead fume may be removed or diluted, so as to reduce the hazard of plumbism, which is often very great.

Georgia M. Association Journal, Atlanta

17: 484-534 (Nov.) 1928

Successful Vaccine Prophylaxis and Treatment of Whooping Cough. L. Bivings, Atlanta.—p. 484.
Primary Anemia: Treatment with Liver Fraction. G. Giddings, Atlanta. —p. 486.
Intussusception. W. A. Selman, Atlanta.—p. 490.
Infantile Eczema: Causes and Treatment. B. Bashinski, Macon.—p. 497.
Basal Metabolism in Normal Children from 6 to 12 Years of Age. G. F. Klugh, Atlanta.—p. 500.
Complications Sometimes Overlooked in Diseases of Children. R. E. McGill, Alexandria, La.—p. 502.
Treatment of Varicose Veins and Ulcers. B. C. Teasley, Hartwell, and H. E. Teasley, New Orleans.—p. 506.
Our Tuberculosis Problem. W. C. Humphries, Griffin.—p. 509.
Ureteral Stricture. H. W. Birdsong, Athens.—p. 512.
Indigestion: Its Relation to Gallbladder Disease: Clinical Aspect of Cholecystic Disease. W. C. Pumpelly, Macon.—p. 514.
Otitis Media: Ionization or Electromedication in Treatment of Chronic Purulent Cases. A. G. Fort, Atlanta.—p. 519.

Journal of Experimental Medicine, Baltimore

48: 751-913 (Dec. 1) 1928

Variants of Hemolytic Streptococci: Relation to Type-Specific Substance, Virulence and Toxin. E. W. Todd and R. C. Lancefield, New York. —p. 751.
Antigenic Differences Between Matt Hemolytic Streptococci and Their Glossy Variants. R. C. Lancefield and E. W. Todd, New York.—p. 769.
*Active and Passive Immunity to Pneumococcus Infection Induced in Rabbits by Immunization with R Pneumococci. W. S. Tillet, New York.—p. 791.
*Suppression of First Attack with Subsequent Relapse: Immune Phenomenon in Experimental Relapsing Fever. H. E. Meleney, Nashville, Tenn.—p. 805.
Flagellar and Somatic Agglutination. J. B. Nelson, Princeton, N. J. —p. 811.
Removal of Agglutinin from Sensitized Motile Bacteria. J. B. Nelson, Princeton, N. J.—p. 825.
*Acid-Base Composition of Gastric Secretions. J. L. Gamble and M. A. McIver, Boston.—p. 837.
Acid-Base Composition of Pancreatic Juice and Bile. J. L. Gamble and M. A. McIver, Boston.—p. 849.
Body Fluid Changes Due to Continued Loss of External Secretion of Pancreas. J. L. Gamble and M. A. McIver, Boston.—p. 859.
*Studies in Experimental Extracorporeal Thrombosis: VII. Extracorporeal Thrombosis in Experimental Obstructive Jaundice and After Intravenous Administration of Bile Acids. W. R. Johnson, T. Shionoya and L. G. Rowntree, Rochester, Minn.—p. 871.
*Production of Experimental Typhoid in Guinea-Pig with In Vivo Prepared Toxic Filtrate of B. Typhosus. W. H. Harris and O. M. Larimore, New Orleans.—p. 885.

Immunization Against Pneumococci.—Tillet asserts that rabbits, vaccinated by repeated intravenous injections of suspensions of heat-killed R pneumococci, acquire a marked degree of active immunity to infection with the virulent S forms of pneumococcus types I and II. This immunity is effective when the infecting organisms are injected intravenously, intraperitoneally or intradermally. Whole citrated blood or the serum of rabbits immunized with R pneumococci, under the experimental conditions described, is capable of passively protecting normal rabbits against type I and type III infection. Whole blood appears to be more effective than an equivalent amount of serum. Passive protection of mice by the use of the whole blood or serum of the immune rabbits has been entirely ineffectual. This is in striking contrast to the results obtained with type-specific immune serum. This form of acquired resistance to pneumococcus infection, elicited by R organisms which are devoid of type specificity, and exemplified in animals whose serums do not possess any demonstrable type-specific

antibodies, has many characteristics strongly suggesting that the underlying mechanism differs from that concerned in type-specific immunity.

Immune Phenomenon in Experimental Relapsing Fever.—In five splenectomized squirrels and chipmunks which were reinoculated by Meleney with a strain of *Spironema recurrentis* which had previously been present in their blood, the first attack was entirely suppressed because the animals were immune to the strain of spirochetes inoculated; but after the interval which usually occurred between attacks, a relapse ensued, in which the strain of spirochetes present in the blood was different from the strain inoculated.

Acid-Base Composition of Gastric Secretions.—The effects of continued loss of the external secretion of the pancreas are explained by Gamble and McIver as follows: The underlying event is a steadily increasing deficit of sodium and of chloride ion owing to the large requirement for these electrolytes in the construction of pancreatic juice. In consequence there is continued loss of water, chiefly from the body fluids in which sodium and chloride ion are large factors of total ionic content, viz., interstitial fluids and the blood plasma. During about two thirds of the survival period, the volume and composition of the blood plasma remain approximately normal, the losses of water, sodium and chloride ion being replaced at the expense of interstitial fluids. Reduction of the volume of these fluids is indicated by loss of body weight beginning directly after establishment of the pancreatic fistula. Ultimately reduction of plasma volume begins and, as it progresses, serious symptoms develop and death occurs unless water, sodium and chloride ion are abundantly replaced. Owing to the relatively greater loss of sodium than of chloride ion in pancreatic juice, reduction of bicarbonate ion concentration in the plasma tends to occur. The death of the organism may be simply and reasonably explained as the result of progressive impairment of the function of the blood by the physical changes, dehydration and acidosis produced in the plasma by the continued loss of sodium and of chloride ion in the pancreatic juice.

Experimental Extracorporeal Thrombosis.—Johnson et al. state that in experimental obstructive jaundice in rabbits, thrombosis is definitely delayed in the extracorporeal loop. White thrombi are laid down at the normal rate in many instances; in others there is a delay in deposition of platelets, while in still others cauliflower-like masses of platelets are rapidly deposited and tend to slow or even to stop the blood stream before much fibrin is apparent. Fibrin deposits and formation of the red thrombus usually appear late in the experiment and often only at the ends of the collodion tubes. In vigorous animals, the thrombi rarely tend to obstruct and usually cease growing when they have made up the difference between the lumen of the glass tube and of the collodion tube. On the other hand, if the animal's general condition is poor and its circulation depressed, red thrombus forms more rapidly and tends to encroach progressively on the lumen until obstruction takes place. Even in such cases circulation through the loop persists for much longer periods than in the normal animal. Judging from the gross appearance of the thrombus, the quantity and quality of fibrin seem deficient. Single injections of bile salts yield pictures similar to those seen in experimental obstructive jaundice. White thrombi are deposited but obstruction of the lumen is delayed because of inadequate formation of fibrin. The continuous intravenous injection of bile salts resulted in a progressive increase of the clotting time and of the level of bile acids of the blood. The state of the extracorporeal loop was likewise similar in many respects to that seen in obstructive jaundice. There was, however, a definite decrease in the size and numbers of white thrombi deposited on the collodion membrane. From the evidence presented, it is obvious that the processes of blood coagulation and of thrombosis in the extracorporeal loop are definitely delayed in experimental obstructive jaundice and in animals that have received intravenous injections of bile salts. No attempt is made to explain the changes found in jaundice on the basis of the increased levels of bile acids in the blood, although these experiments would indicate that such a possibility has not been ruled out.

Experimental Typhoid.—Harris and Larimore assert that during the activity of peritonitis produced in the guinea-pig by means of *Bacillus typhosus*, there is formed in the exudative material a filtrable toxic moiety which, when inoculated into normal animals of this species, produces certain of the clinical phenomena and a pathologic picture simulating that of human typhoid.

Journal of Industrial Hygiene, Baltimore

10: 295-330 (Nov.) 1928

Catarrhal Prophylaxis in Industry. N. H. Mummery, London.—p. 295.
Respiratory Disease in Industry. R. M. Hutton, Toronto.—p. 297.
Medical and Industrial Findings Among Spray Painters and Others in Automobile Refinishing Trade in Manhattan, Greater New York. J. Meyers, New York.—p. 305.
Phosphorus Necrosis in Manufacture of Fireworks. E. F. Ward, Baltimore.—p. 314.

Journal of Laboratory and Clinical Medicine, St. Louis

14: 103-194 (Nov.) 1928

Comparison of Agglutinin and Antitoxin Content of Antidysenteric Serums. E. M. A. Enlows and S. C. Brooks, Washington, D. C.—p. 103.
Morphology and Motility of Fusiform Bacilli. C. C. Kast, Philadelphia.—p. 112.
*So-Called Chemical Test in Blood for Sex Differentiation. H. Sharlit and I. Lorberblatt, New York.—p. 119.
*Distribution of Calcium in Jaundiced and Acholic Dogs. W. C. Emerson, Rochester, N. Y.—p. 122.
Rôle of Complement in Health and Disease: Hemolytic Complement of Human Serums. L. G. Hadjopoulos and R. Burbank, New York.—p. 131.
Experimental Acute Mercurialism. S. Goldblatt, Cincinnati.—p. 145.
Use of Dogs in Assay of Digitalis: Comparison with Results Obtained on Cats. C. C. Haskell, and Others, Richmond, Va.—p. 155.
Determination of Ammonia by Aeration. G. J. Cox, F. Briggs and L. Hudson, Urbana, Ill.—p. 159.
Clinical Value of Salivary Urea Index. C. L. Stealy, San. Diego, Calif.—p. 162.
Gingivitis, III: Laboratory Methods for Study. R. A. Keilty, Washington, D. C.—p. 165.
Apparatus for Shaking Blood Counting Pipets. R. F. Feemster, New Orleans.—p. 169.
Tendon Clamp for Measurements of Muscular Tension. E. Karrer and H. C. Stevens, Cleveland.—p. 171.
Method for Staining Connective Tissue Mast Cells. M. Levine, New York.—p. 172.
Method of Elimination of Anticomplementary Result in Many Wassermann Tests. H. R. Fishback, Chicago.—p. 176.

Chemical Blood Test for Sex Differentiation.—The urine of more than 100 women was tested by Sharlit and Lorberblatt by means of their revised Manoilov test at different times; in many instances different samples were secured from the same individual. The color values were found to vary for the urine specimens of different individuals and also for different samples of the same individual. These variations covered the whole range of color of the standard tubes. Similar results were secured on samples from males.

Distribution of Calcium in Jaundice.—Emerson points out that there is a marked decrease in the serum calcium and in the whole blood calcium, and a very marked decrease in the diffusible calcium in dogs jaundiced over a period of forty days. There is also a decrease in the calcium content of the brain, spleen and subcutaneous tissue and an increase in the calcium content of the muscle, bone, suprarenal, heart and thyroid. In dogs with a bile fistula over a period of seventy-nine days, there is a marked increase in the serum calcium and the whole blood calcium and a very marked increase in the diffusible calcium. There is also a marked increase in the calcium content of the bone, an increase in the calcium content of the thyroid, lung and kidney, and a decrease in the calcium content of the feces, subcutaneous tissue, heart, gallbladder and suprarenal.

Journal of Pharmacol. & Exper. Therap., Baltimore

34: 239-331 (Nov.) 1928

Peripheral Vasomotor Mechanism in Experimental Shock. M. I. Smith, Washington, D. C.—p. 239.
Studies in Serum Calcium: II. Experimental Tuberculosis: Intraperitoneal Inoculation. J. C. Hoyle, Cambridge, England.—p. 259.
Renal Blood Flow of Bird. O. S. Gibbs, Halifax, N. S.—p. 277.
New Method of Measuring Blood Flow. O. S. Gibbs, Halifax, N. S.—p. 293.
*Stimulating Effect of Alcohol and Depressing Effect of Anesthetics on Sugar Utilization Directly Determined. W. E. Burge and D. J. Verda, Urbana, Ill.—p. 299.

Renal Excretion of Chlorides and Water. A. R. Fee, London.—p. 305.
*Studies in Serum Calcium: III. Experimental Tuberculosis—Subcutaneous Inoculation. J. C. Hoyle, Cambridge, England.—p. 317.
Thermal Conductivity Methods of Gas Analysis in Study of Pharmacologic Problems. P. D. Lamson and B. H. Robbins, Nashville, Tenn.—p. 325.

Effect of Alcohols and Anesthetics on Sugar Metabolism.—The effect of alcohols and anesthetics on sugar metabolism was studied by Burge and Verda. Methyl and ethyl alcohols increased sugar utilization to a marked degree, while glycerol increased it only moderately. Chloroform and ether produced a significant decrease in sugar utilization and deep anesthesia; ethylene decreased sugar utilization and produced slight anesthesia, while nitrous oxide had practically no effect on sugar utilization and did not produce any anesthesia.

Serum Calcium in Experimental Tuberculosis.—Hoyle states that in rabbits inoculated subcutaneously with bovine tuberculosis, the serum calcium constantly rises to the upper physiologic limit, or rather above, during the formation of the local lesion. When the local lesion ulcerates the serum calcium falls, later returning to normal, with improvement in the condition of the ulcer. This fall is associated with and probably due to the presence of secondary infection. No fall in the serum calcium is found in the final weeks of the disease. It is suggested that the absence of such a fall as occurs following intraperitoneal inoculations is due to the extent of disease in the lungs, which causes disturbance of the normal acid-base balance of the blood.

New England J. Medicine, Boston

199: 1073-1128 (Nov. 29) 1928

*Infrequency of Primary Infection in Gallbladder Disease. H. M. Feinblatt, New York.—p. 1973.
Management of Frontal Sinus Infection. O. A. Lothrop, Boston.—p. 1078.
Some Deceptions and Surprises in Course of Pulmonary Tuberculosis. E. O. Otis, Boston.—p. 1081.
Diagram of Arterial Circulation of Basal Ganglions. H. F. Aitken, Boston.—p. 1084.
Progress in Psychiatry. I. H. Coriat, Boston.—p. 1085.
Situation in Rural Districts as Regards Medical Services. G. B. Horton, Montpelier, Vt.—p. 1091.
Why Situation in Rural Districts as Regards Medical Service? J. N. Jenne, Burlington, Vt.—p. 1099.

Infrequency of Primary Infection in Gallbladder Disease.—According to Feinblatt, microscopic study of the gallbladders removed at operation leads to the belief that the rôle of infection in the causation of cholecystitis has been greatly overestimated, while the importance of metabolic and mechanical factors has not received due consideration. Primary infectious lesions of the gallbladder are exceedingly rare and focal infection arising from this organ has not been proved. Since cholecystitis rarely gives rise to peritonitis, the emergency treatment for gallbladder disease can in no sense be compared with that for appendicitis. The treatment of cholecystitis is primarily a medical situation, which becomes surgical only when mechanical complications develop.

Pennsylvania M. Journal, Harrisburg

32: 49-128 (Nov.) 1928

Present-Day Cult Problem. P. R. Correll, Easton.—p. 49.
Pathology and Treatment of Pyogenic Arthritis. D. B. Phemister, Chicago.—p. 52.
Periodic Examinations as Aid in Prevention and Early Recognition of Cancer and Other Diseases. J. C. Bloodgood, Baltimore.—p. 57.
Treatment of Pelvic Infections. G. G. Ward, New York.—p. 63.
Myocardial Disturbances Due to Abnormal Thyroid Function and Their Management. H. A. Christian, Boston.—p. 70.

Philippine Journal of Science, Manila

37: 1-131 (Sept.) 1928. Partial Index

*Plasmoquine (Plasmochin). C. M. Hasselmann and M. Hasselmann-Kahlert, Manila.—p. 75.
Malaria Transmission. C. Manalang, Manila.—p. 123.

Plasmochin in Malaria.—Ninety cases of naturally acquired malarial infection were treated by Hasselmann and Hasselmann-Kahlert with plasmochin. Forty of these cases were tertian infections and from 0.12 to 0.32 Gm. of pure plasmochin was given daily. There was freedom from parasites in from two to six days after treatment was begun. Thirty-one of the cases were simple estivo-autumnal infections and "plasmochin compound" was given on an average of from one tablet three times daily (child) to five tablets four times daily. Each tablet contained 0.005 Gm. of plasmochin and 0.0625 Gm. of quinine sulphate. The patients were freed from parasites in from two to ten days after treatment began. Eighteen cases were double infections. Those patients who showed in the first blood examinations only tertian parasites were given pure plasmochin, which was changed to plasmochin compound as soon as the double nature of the infection was revealed. The other patients with both types of parasites, or with only subtertian forms in the beginning, were given plasmochin compound at once. In all cases splenic enlargement rapidly decreased. It seems that in double infections plasmochin has somewhat of a provocative effect; that is, when only one type of parasite is found in the peripheral blood, after administration of pure plasmochin, the subtertian forms appear in the peripheral blood. After administration of plasmochin compound, on the other hand, the tertian forms often appear; but in these cases only tertian schizonts appeared and never the sexual forms contradictory to the appearance of crescents in the suspected simple, benign, tertian infection. Small estivo-autumnal rings persisted for a longer time in the peripheral blood if previous medication with pure plasmochin had been given. Relapses were exceptionally few as compared with relapses after quinine medication. Side effects, such as gastralgia and abdominal pains, cyanosis of the lips and the finger tips, and paleness of the skin, occasionally occurred, especially after pure plasmochin, but never to the extent of requiring the discontinuance of the medication. On the other hand, these possible side effects make medical supervision absolutely indispensable and plasmochin unfit for self treatment, after treatment or prophylaxis without this medical care. Nor is plasmochin suitable for prophylaxis, on a large scale, except under strict daily medical supervision for a possible sterilization of a certain population, say for about ten days, with the object of freeing all possible carriers from gametocytes.

Public Health Reports, Washington, D. C.

43: 3147-3249 (Nov. 30) 1928

Cooperative Rural Health Work of Public Health Service in Fiscal Year, 1928. L. L. Lumsden.—p. 3149.

Radiology, St. Paul

11: 447-528 (Dec.) 1928

Extra-Abdominal Affections Giving Gastro-Intestinal Symptoms: Ménière Syndrome. A. W. Crane, Kalamazoo, Mich.—p. 447.
Movements of Duodenal Contents: Antiperistalsis and Pyloric Regurgitation. R. W. A. Salmond, London.—p. 453.
Value of Synchronization in Accurate Diagnosis of Chest Diseases. F. M. McPhedran and C. N. Weyl, Philadelphia.—p. 458.
Mechanical Explanation of Biologic Action of Radiation. S. Brown, Cincinnati.—p. 466.
Bone Changes in Leprosy. R. Hopkins, New Orleans.—p. 470.
Surface Applications of Radium. G. W. Grier, Pittsburgh.—p. 474.
Actual Technic of Examination of Spinal Cavities with Lipiodol. J. Forestier, Aix-les-Bains, France.—p. 481.
Myelosarcoma of Lower Jaw with Metastases. L. Schultz and E. C. Piette, Oak Park, Ill.—p. 490.

South Carolina M. Association Journal, Greenville

24: 241-268 (Nov.) 1928

Diagnosis and Surgical Management of Spinal Cord Tumors. R. G. Doughty, Columbia.—p. 244.
Splenectomy in Purpura Hemorrhagica (Essential Thrombocytopenia). J. S. Rhame, Charleston.—p. 247.
Health Examination of Ear, Nose and Throat. W. B. McWhorter, Anderson.—p. 252.
Syphilis of Stomach: Three Cases. J. G. Murray, Greenville.—p. 254.

Texas State J. Medicine, Fort Worth

24: 459-518 (Nov.) 1928

What May We Expect from Treatment of Cancer of Breast? U. V. Portmann, Cleveland.—p. 467.
What Should Be Surgical Attitude Toward Treatment of Advanced Cancer Cases? J. T. Moore, Houston.—p. 474.
Cancer: To What Extent Does Medical Treatment Influence Progress of This Disease? Q. B. Lee, Wichita Falls.—p. 476.
Carcinoma of Cervix. W. P. Brown, Fort Worth.—p. 479.
Value of Blood Cultures in Internal Medicine. H. M. Winans, Dallas, and J. Caldwell, Mineral Wells.—p. 482.
Prevention of Heart Disease. L. Rice, San Antonio.—p. 484.
*Hearts and High Blood Pressure. M. L. Graves, Houston.—p. 486.
Practical Uses of Electrocardiogram. J. Kopecky, Galveston.—p. 488.
Classification and Diagnosis of Feeblemindedness. J. G. Wilson, Brownsville.—p. 494.

*Importance of Vital Statistics in Public Health Service. J. G. Townsend, Little Rock, Ark.—p. 499.
*Cooperative County Health Work. E. W. Prothro, San Benito.—p. 502.

Heart and High Blood Pressure.—Of the seventy patients analyzed by Graves, the youngest was 28, and the oldest, 78. Forty-one were above 50 years of age, while only nine were under 40, and only one was below 30. The family histories showed only twenty-nine patients with recognizable illnesses, usually of the kidney alone or with cardiovascular disease, but they did not suggest any hereditary factor such as arteriosclerosis. Thirty-one showed positive evidence of cardiac enlargement, while in the remaining thirty-nine examination was negative or doubtful. All of the patients were ambulatory, and nearly all remained as office patients except when put to bed for periods of rest in the hospital or home. Only sixteen presented signs and symptoms of circulatory distress while under observation. Of the seventy patients, forty-seven presented secondary renal-cerebral or cardiac complications. Of the whole number, fifty-two showed evidence of complicating infections in the teeth, tonsils, sinuses, prostate, pelvis and elsewhere, but without certain suggestive association. The blood pressures in this group were decidedly pathologic, with one or two insignificant exceptions. Their variations were between the highest reading of 294 systolic and 158 diastolic to the lowest of 144 systolic and 102 diastolic. Graves contends that the knowledge of this disease is defective and therefore the resources for material help are limited.

Importance of Vital Statistics.—Townsend says that when full-time health service is in operation, better reporting of vital statistics should be observed, as the health officer can materially assist in stimulating this phase of health endeavor. In reciprocation he should be advised as to births and deaths when they occur. Practically all of the local full-time health officers are appointed with the approval of the state health officer and have an official status with the state health department. They are part of the organization, and if practical the reports of registrars should be forwarded through the full-time health officer, if one is in the county. He makes the record for his file and immediately forwards the reports to the state board of health or, if this is not practical, the central office should advise the local health officers of the birth and death rates in their communities. It is apparent that the development of vital statistics records has been far in advance of the establishment of local full-time health services and yet the latter are, or should be, most valuable in stimulating an adequate protection against the conditions which these records reveal. In the registration area there is a yearly average of 1,500,000 deaths from all causes, and 500,000 are preventable. This entry in the books of life is not creditable but is valuable in presenting a problem which can be solved. If the registration area can be completed by 1930 (the date of the next census), it will be a distinct step forward in evaluating and better determining the public health problems.

Cooperative County Health Work.—Prothro states that in his county excellent cooperation is received from the staffs of both urban and rural school systems, and other organized bodies give opportunities for the making of suggestions on health problems, with the result that a small personnel, within the past year, accomplished much. They organized twenty monthly child health conferences, held 200 meetings, and examined 1,000 infants, 2,000 preschool children, 14,000 school children and 1,000 adults. As a follow-up to these examinations, more than 1,000 corrections were secured. They held 5,000 private and 300 group conferences, gave 1,000 health talks, had published 150 health articles and distributed 12,000 pieces of health literature. Twelve thousand smallpox vaccinations were made, and 10,000 prophylactic injections for diphtheria, 1,000 for scarlet fever and 3,000 for typhoid were given. Five standard milk ordinances were passed, and 4,000 cows were tested for tuberculosis. One hundred and fifty dairies were inspected and graded. The necessary laboratory work for these dairies was done and the personnel of each was trained in sanitary measures. Regular inspections of 150 food handling places, twenty camp yards and various other public places were made, besides periodic surveys of private premises in four cities, and a most thorough yearly clean up in which Prothro obtained the assistance of the boy scouts in the cities and each rural school child in the country. During these inspections, 20,000 corrections were made, including policing of yards, repairing of toilets, screening of houses, and the like. These and many other accomplishments were obtained at a cost of $15,000, which is less than 20 cents per capita and less than a mill on the total valuation of the county. During this time local physicians noted a marked increase in the number of biologic tests they made and a proportionate increase in the number of examinations of comparatively well infants, children and adults. The public made fewer calls on cults and patent medicine firms, and was therefore better able to pay for medical services rendered. The county or one or more of its cities had formerly been compelled almost yearly to establish some expensive quarantine camp; this was not found necessary during the three years of the functioning of the unit. Nor has it been necessary during this period to close one or more of the schools each year on account of epidemics, as has formerly been the case. The former death rate from infant and preventable diseases has been markedly decreased despite congestion, increasing the expectancy. The people are now actually drinking home milk, eating home vegetables and are not afraid to visit neighboring villages lest they contract some plague. This proves that a health department with the proper personnel, supervision and cooperation is worth while.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2: 829-878 (Nov. 10) 1928

*Differential Diagnosis and Treatment of Cerebral States Consequent on Head Injuries. C. P. Symonds.—p. 829.
*Effects of Irradiated Ergosterol in Large Doses. W. E. Dixon and J. C. Hoyle.—p. 832.
Influence of Industrial Poisons on Different Organs. T. Oliver.—p. 835.
*Early Recognition and Treatment of Cancer of Stomach. E. Spriggs.—p. 838.
Dermatologic Indications for Souttar's Cautery. H. C. Semon.—p. 840.
*Therapeutic Value of Valerian. J. S. Manson.—p. 842.
Fracture Dislocation of Odontoid Process: Case. H. C. W. Nuttall.—p. 843.
*Treatment of Nonspecific Diarrhea in Tropics. C. V. Thornton.—p. 843.
Foreign Body (Clay Bead) in Lung. W. Stewart.—p. 844.
Hemophilia in Tropics. B. Rattan.—p. 844.
Acute Gastric Dilatation After Double Extra-Uterine Pregnancy. N. J. Everard.—p. 845.

Cerebral States Consequent on Head Injuries.—Of eighty patients who have been under Symonds' care with symptoms of cerebral contusion, eighteen made a complete recovery. Of seventy-one who were dependent for their livelihood on regular employment, thirty-three were able to return to full work; thirty-one were able to return to light work, and seven were totally incapacitated. Of fifty-four with minor contusion, twenty-eight were able to return to full work; twenty-four were able to return to light work, and two were totally incapacitated. Of seventeen with major contusion, five were able to return to full work; seven were able to return to light work, and five were totally incapacitated. These figures show that in the case of a major contusion, the chances of the patient being able to return to his full work are less than one in three, and there is the same chance of total incapacity. In cases of lesser injury, there is an even chance of the patient being able to return to full work, and a very small risk of total incapacity. For the purposes of obtaining these figures, the criterion taken for a diagnosis of major contusion was that the patient should have been in a state of unconsciousness, or partial unconsciousness, for more than twenty-four hours following the injury. In cases of persistent contusion headache unrelieved by medical treatment, surgical decompression has been advocated.

Effects of Irradiated Ergosterol in Large Doses.—Observations were made by Dixon and Hoyle to determine the effects of large doses of irradiated ergosterol on rats fed with a normal diet, including an ample supply of vitamins A, B and C. They demonstrate that grossly excessive amounts interfere with calcium metabolism to the extent that all the treated rats form calcium phosphate concretions in the urinary tract. It is suggested that this is dependent on an increased absorption of calcium and phosphate from the bowel and their excretion by the kidneys. No confirmation has been obtained of the pathologic changes found to occur with similar doses by certain German observers.

Carcinoma of Stomach.—Thirty-eight consecutive cases, in all of which the clinical study was combined with radiologic, chemical and, in some, operative examinations, are analyzed by Spriggs with reference to early symptoms. The symptoms complained of in order of frequency were: discomfort or pain in the abdomen; lack of appetite, dislike of food, nausea; loss of weight; vomiting; flatulence or distention; heartburn and eructation; weakness; dysphagia or inability to take solids; constipation; hematemesis; diarrhea; tumor. The average order in which they first appeared was: (1) discomfort or pain in the abdomen not related to food; (2) loss of appetite or dislike of food, and nausea; (3) pain or discomfort after food; (4) heartburn and eructation; (5) flatulence; (6) vomiting; (7) regurgitation of mucus; (8) weakness and constipation; (9) loss of weight; (10) dysphagia or inability to take solids; (11) tumor. In three cases hematemesis was the first indication of the disease, and in two, diarrhea was the first indication. In two thirds of the patients the symptoms dated back more than nine months, on the average an interval of a year or more having elapsed before a full investigation was made. The pain or discomfort is often relieved by food in cancer of the pylorus and of the body of the stomach. The earliest objective sign of cancer is probably local arrest of the wave in the stomach, as shown by roentgen rays. This is demonstrated by the superposition of serial films taken at such an angle that the lesion is in profile. The sign is common to cancer, ulcer and fixation by adhesion. A filling defect, or much induration, as shown by bending over the shadow at the edge of an ulcer, is, as a rule, significant of cancer. The tests for achylia and occult blood are of great value. Spriggs says that it is wrong to treat indigestion for any length of time in a middle-aged person without taking steps to exclude cancer; indigestion is not a diagnosis. If there is clinical and radiologic evidence of cancer, the risk of operation to make sure is much smaller than the risk of watching the patient. The fight against cancer is a fight for early diagnosis. If the delay between the onset of symptoms and investigation could be avoided, life could be saved or prolonged in a good proportion of cases. Earlier diagnosis can and should be made.

Therapeutic Value of Valerian.—Manson is impressed with the value of valerian in the treatment of minor neuroses. In the type of cases in which valerian is indicated, the symptoms usually described are: palpitation, something rising in the throat, flatulent eructations, rumbling of the bowels, sense of pressure on the vertex, desire to be alone, and lack of interest in home and social surroundings, fear of something going to happen, unrestful sleep accompanied by disturbing dreams, lack of mental concentration and general depression, so marked at times that thoughts of suicide creep into the mind—in other words, the first stage of melancholia. Manson prescribes the ammoniated tincture of valerian in half-drachm doses with 7½ grains (2 cc. in 0.5 Gm.) of potassium bromide. He is convinced that there is enough evidence to show that valerian contains some definite property which has a decided and specific beneficial action on the higher levels—and perhaps also on the lower—of the central nervous system.

Treatment of Nonspecific Diarrhea.—The treatment employed by Thornton in these cases is as follows: The patient must be put to bed for at least three days, preferably longer. All solid food must be stopped and only citrated milk or milk that has been peptonized given. Further, the milk must not be given in a large quantity at any one feeding. A cupful of it should be administered every two hours. Barley water is allowed without restriction. The mainstay of the treatment, however, is extract of liver, and this can conveniently be given as soup or in the powder form. The following is the recipe for making the soup: Half a sheep's liver is minced finely, and four breakfastcupfuls of cold water and such spices as the patient may like are added. This mixture is boiled down to two cupfuls, and is strained, small particles of the liver substance being allowed to come through; the patient is given one cup in the morning and one in the evening. In furtherance of the calcium deficiency theory, 15 grains (1 Gm.) of calcium lactate may be given thrice daily. The success of this treatment in these cases of nonspecific diarrhea is said to be most striking, and any case which does not respond favorably in a few days should be regarded from a serious standpoint.

Indian Medical Gazette, Calcutta

63: 613-672 (Nov.) 1928

Plea for Vaginal Hysterectomy in India: 150 Cases. V. B. Green-Armytage.—p. 613.
Prostatism. J. R. Roberts.—p. 617.
Nutrition of Lens and Vitreous. H. Smith.—p. 619.
*Use of Certain Preparations in Leprosy. J. M. Henderson and S. P. Chatterji.—p. 620.
*Simplified Bedside Blood Sugar Method. H. N. Mukherjee.—p. 624.
*Easy Method of Draining Inaccessible Suppurating Cavities. S. R. Iyer.—p. 626.
*Diagnostic Value of Monocytosis. H. R. Dutton.—p. 627.
*Simplified Technic for Culturing Malarial Parasites Aerobically. R. Row.—p. 628.
*Plasmoquin in Treatment of Malaria. P. Bhattacharyya and S. P. R. Chowdhury.—p. 630.
Typhus-Like Fever (Colonel Megaw's Tick-Typhus?). G. Ghose.—p. 634.
Cerebral Symptoms Associated with Filaria. T. Mya.—p. 636.
Toxic Symptoms Following Administration of Carbon Tetrachloride. A. C. Mitra.—p. 637.
Digitalis: Auricular Fibrillation. P. V. Karamchandani.—p. 637.
Case of Renal Calculi at West Hospital, Rajkot. J. F. Henriques.—p. 638.
Case of "Eclipse Blindness." S. C. Sen Gupta.—p. 638.
Case of Intestinal Obstruction Following Penetrating Wound in Abdomen. P. N. Basu and T. B. Menon.—p. 639.
Electrocoagulation (Diathermy) in Malignant Growth of Face. P. P. Lalvani.—p. 640.
Pentavalent Antimony Compounds in Tropical Medicine. H. Schmidt.—p. 643.
Scientific and Economic Importance of Research on Indian Medicinal Plants. S. Ghosh.—p. 650.

Treatment of Leprosy.—The results obtained from the use of three different preparations are recorded and analyzed by Henderson and Chatterji. Of the three preparations in question, copper chloride-*p*-diazoiminobenzene hydrochloride and a purified amber oil tar appear to have some power, inducing the onset of leprous reactions when used in relatively large doses. In virtue of this "lytic" effect on the leprous granulation tissue, they may be of some assistance as adjuvants in the treatment of the disease. Their reaction producing power is, however, definitely inferior to that of potassium iodide. A 15 per cent solution of a double salt of thiosinamine and sodium salicylate in the amount and frequency of dosage used by the authors appears to be without action on leprous granulation tissue. None of the preparations has any direct action whatever on the organismal cause of this disease—*M. leprae*. No toxic effects directly attributable to either preparation were noted in the cases of the copper salt and the purified amber oil tar: the use of the double salt of thiosinamine and sodium salicylate, however, causes certain unpleasant sequelae; viz., pain at injection lasting up to forty-eight hours, headache, vertigo, vomiting and sometimes tremors.

Simplified Bedside Sugar Determination Method.—The method described by Mukherjee is a modification of Folin's method. The sugar is oxidized with alkaline potassium ferricyanide and the ferrocyanide produced is measured colorimetrically as prussian blue. The color obtained is nearly five times as deep as the color obtained with the alkaline copper solutions. The results obtained are fairly accurate for clinical purposes and the technic is so simple that it can be easily mastered in a short time. The quantity of blood necessary for the test is extremely small and can be conveniently drawn from a finger prick by means of a hemocytometer pipet (up to 0.5 mark only).

Method of Draining Inaccessible Pus Sacs.—Iyer fits the nozzle of a 4 ounce or 8 ounce glass syringe into a Jacques' catheter of the required size and charges the catheter and the syringe with weak iodine solution. The catheter is introduced into the bottom of the cavity to be drained. The solution is injected slowly and the contents are withdrawn. The syringe is taken out, the catheter being left in the cavity. The process is repeated six or eight times until the contents drawn from the cavity are nearly of the same color as the solution injected. Before the catheter is finally drawn out, some solution is left in the cavity to prevent sudden withdrawal of pressure on the blood vessels and other structures which are in relation with the cavity.

Diagnostic Value of Monocytosis.—An increase in the monocytes of the blood as an aid in the diagnosis of a protozoal infection is regarded by Dutton as being of much significance.

Four per cent is considered the healthy average, 5 per cent suggestive and 6 per cent and over proof, except in certain specified conditions, of a protozoal infection.

Aerobic Cultures of Malaria Parasites.—A constant laboratory temperature of 40 C. prevails in Bombay and yields cultures, which, while of distinctly slower growth, are otherwise quite good in both richness and quality. Row inoculates the culture tubes at the bedside. This slightly delayed development was found to be of advantage, as it gave more time and greater ease for observation; thus the malignant tertian parasites took seventy-two hours or more, from the ring stage to complete schizogony, instead of forty-eight hours, and the benign tertian required forty-eight hours or more instead of thirty-two hours, when left outside the incubator. The second more important detail was to see the effects of eliminating the anaerobic part of the apparatus and putting up the culture in a stand. It was found that this procedure had hardly any deleterious effect on the yield or quality of the culture. The essential requisites for a culture are a flat bottomed microculture tube and an adequate mixture of dextrose solution in the nutrient medium, which consists of a serum not necessarily fresh or autogenous.

Value of Plasmochin in Treatment of Malaria.—An experience with twenty-five cases of all forms of malaria has convinced Bhattacharyya and Chowdhury that plasmochin has its own sphere of action in the treatment of malaria. It can cure a case of benign tertian or quartan infection more quickly, more steadily and more easily than quinine. All cases responded very quickly to the treatment and in none was there any recurrence of fever afterward. It acts in very small doses, and being tasteless can easily be taken by children. It cannot, however, replace quinine. It has no action on the asexual forms of malignant tertian parasites. It has been observed that if there is a malignant tertian infection superimposed on a benign tertian or quartan infection and this is overlooked, plasmochin will fail to produce the desired effect. Hence only those who have the facilities to distinguish the different types of malaria by the examination of blood can make a choice between quinine and plasmochin for the respective cases. In cases of malignant tertian infection also, it may be given along with quinine. The drug may be used without much risk. In none of the cases under observation was there any untoward effect or toxic symptom noticed after its use, except in a neurotic patient in whom there were cramps in the abdomen on the fifth day of its use.

Lancet, London

2: 1061-1114 (Nov. 24) 1928

Story of Nicholas Culpepper: Astrologer-Physician. R. Kipling.—p. 1061.
*Treatment of Patients with Inoperable Cancer. R. B. Wild.—p. 1062.
Clinical and Biologic Study of Allergy. H. W. Barber and G. H. Oriel.—p. 1064.
*Ultraviolet Ray and Skin Cancer. G. M. Findlay.—p. 1070.
*Tonsillar Hypertrophy and Infection as Factor in Ill Health. D. Paterson and G. W. Bray.—p. 1074.
Interlobar Empyema. W. Broadbent.—p. 1075.
*Skin Irritation Under Ultraviolet Radiation. S. Van S. Boyd.—p. 1076.

Palliative Treatment of Inoperable Cancer.—Wild says that during the last thirty-six years at the Christie Hospital, they have tried every suggested treatment for cancer which was properly brought to notice, and so far have not found that any drug, whether organic, inorganic, animal extract, serum or bacteriologic product, given by mouth, subcutaneously or intravenously, had any permanent effect in arresting the growth or preventing secondary deposits. Wild does not agree that cancer patients should be told the nature of their disease. When a patient knows that he has cancer, it is most desirable to hold out the hope of recovery, even to the last. The cachectic state which is present in most patients with advanced cancer should be treated by fresh air, tonics and alcohol. An open-air life in a mild climate is undoubtedly to be advised for all patients whose means and circumstances admit of it. The patient should be encouraged to continue his usual pursuits as long as he is physically capable of doing so. Any intercurrent condition, such as indigestion or constipation, must be treated on ordinary lines, but as a general tonic, which often greatly improves the general health, Wild relies on small doses of arsenic with iron and ammonium citrate, and either calumba or gentian. If iron disagrees, the arsenic can be given with dilute hydrochloric acid and compound tincture of cinchona. Alcohol is often a most valuable adjunct to treatment, and in these patients there can be no danger of setting up alcoholic habits; it acts as a euphoric agent, relieves pain, and is a food which does not require digestion. Its use helps the patient to bear his troubles and prolongs his life by from four to six weeks. The amount need not be large to relieve pain. It is best to put off as long as possible the use of opium or morphine. In the early stages acetylsalicylic acid is most useful and does no harm; 10 to 20 grains may be given every eight hours so long as it is effective. When no longer adequate it may be replaced by acetphenetidin or amidopyrine. When opiates are required, Wild prefers opium to morphine. Opium preparations made from watery extracts cause less digestive disturbance than the tincture.

Ultraviolet Rays and Skin Cancer.—By exposure of mice to ultraviolet rays for a period of not less than eight months, Findlay succeeded in producing papillomas and malignant epitheliomas of the skin. When mice are tarred and exposed to ultraviolet rays at the same time, the period necessary for the induction of cancer is shorter than when either tar or the ultraviolet ray alone is employed. A series of mice tarred for one month failed to develop cancer, but when tarred and exposed to ultraviolet rays for the same period, three mice developed malignant growths.

Disease of Tonsil as Factor in Ill Health.—The efficacy of tonsillectomy in selected cases was shown in the cases investigated by Paterson and Bray. Five hundred children, who had come to the hospital complaining of various symptoms, and who were found to have septic or hypertrophied tonsils, reacted in an almost uniformly satisfactory manner to tonsillectomy and rapidly gained weight.

Skin Irritation Under Ultraviolet Irradiation.—Boyd has had a large number of patients who exhibited irritation of the skin in greater or lesser degree following ultraviolet irradiation. Guided by the reaction of the sweat, he has been in the habit of recommending patients who suffered from this trouble to bathe their skins with alkaline lotions. In the milder cases this was effectual. The irritation being allayed, successive doses of radiation rapidly induced such resistance in the skin that the pruritus ceased to occur. In three cases this irritation was so severe that radiation treatment had to be abandoned. An investigation of the alkaline reserve in these cases showed a functional depletion. The absorption power of the blood for carbonic acid was either below or at the low limit of normal. All the urines were highly acid to litmus, and when titrated against tenth-normal sodium hydroxide. An alkaline tolerance test was undertaken, so that any condition of true acidosis, as opposed to functional variations, might be revealed. The practical result of this inquiry has been that a routine examination of the urine is made before treatment is undertaken, and in such cases as show marked acidity an alkaline mixture is prescribed, and, if possible, increased exercise in the open air, in order to prevent such irritation as might arise from deficient alkaline reserve.

Paris Médical

2: 357-392 (Nov. 3) 1928

Annual Review of Children's Diseases in 1928. P. Lereboullet and F. S. Girons.—p. 357.
*Pulmonary Tuberculosis in Girls. P. Nobécourt and J. Coletsos.—p. 369.
*Glandular Fever. J. Comby.—p. 380.
*Importance of Physiologic Cholemia in Icterus Neonatorum. P. Lereboullet.—p. 384.
Periodic Vomiting in Children. M. G. Leven.—p. 388.

Influence of Puberty and Effect of Therapeutic Pneumothorax on Pulmonary Tuberculosis in Girls.—From the study of thirty-four cases of pulmonary tuberculosis in adolescent girls, Nobécourt and Coletsos conclude that the normal evolution of puberty in girls does not seem to favor the development of pulmonary tuberculosis. On the other hand, an abnormal evolution of puberty may or may not favor its development. The authors do not believe that tall young women with a narrow thorax or young women with menorrhagia or metrorrhagia are more susceptible to tuberculosis than are normal young women. They admit the possibility that factory work predisposes children to tuberculosis but emphasize the fact that

many cases of tuberculosis develop in school children. Although all these factors play a rôle, there are numerous cases in which, despite the absence of these external influences, pulmonary tuberculosis develops in girls whose puberty has been irregular. Therapeutic pneumothorax gives good results in cases in which the lesions are unilateral; a warning is sounded, however, against affirming prematurely that patients who have improved following the use of this treatment are cured.

Glandular Fever.—During a familial epidemic of influenza, Comby observed a typical case of glandular fever in a baby, aged 19 months. He regards this as being most unusual.

Importance of Physiologic Cholemia in Production of Icterus Neonatorum.—In a series of hematologic studies begun twenty-seven years ago Lereboullet found a constantly large amount of bile in the blood of new-born infants. He observed that in specimens of blood from babies with icterus neonatorum the proportion of bilirubin differs, varying from 1:500 to 1:2,100; in three cases it was greater than 1:900, the ratio which expresses the maximum amount of bilirubin found in blood from icteric adults. Even in new-born infants without icterus an appreciable cholemia was found during the first few days after birth. The author considers that at the present time the physiologic bilirubinemia of new-born infants is a demonstrated fact; when this bilirubinemia becomes marked, it produces icterus and may reach figures that are much higher than those found in adults. This is to be explained by the following facts: (1) The mass of blood of the new-born infant is relatively small; (2) the volume of the liver in the new-born infant is relatively much larger than in the adult and the organ can therefore elaborate relatively more bilirubin. He also found that there is in the blood of the umbilical cord a relatively high percentage of bilirubin which, however, is less than that in the fetus or the new-born infant. The blood of the mother frequently contains more bilirubin than does normal blood (about 1:30,000 instead of 1:36,500). Mother's blood, therefore, contains only one third as much bilirubin as the blood of the umbilical cord. These facts prove that the blood in the umbilical arteries gives up a part of its bilirubin to the maternal blood; the umbilical cord, therefore, represents the excretory route of the pigments which cannot be eliminated by the kidney or the intestine, and its ligation results in the physiologic hypercholemia of new-born infants.

Schweizerische medizinische Wochenschrift, Basel

58: 1029-1052 (Oct. 20) 1928

*Roentgen Treatment of Abdominal Tuberculosis. E. Wyss.—p. 1029.
Mucin Agar as Culture Medium for Gonococcus. F. L. Spanier.—p. 1034.
Postoperative Pulmonary Complications. C. Perrier and C. Saloz.—p. 1036.
Treatment of Eczema by General Practitioner. Naegeli.—p. 1041.

Roentgen Treatment of Abdominal Tuberculosis.—In tuberculous peritonitis Wyss prefers heliotherapy at high altitudes for patients in good financial circumstances, but for others he recommends roentgen treatment of the local condition followed by ultraviolet irradiation. Roentgen treatment of tuberculous adnexitis gives from 44 to 80 per cent of cures, is safe and has no contraindications. Postoperative irradiation also has given good results. Roentgen treatment is indicated in all cases of tuberculosis of the male genital organs, however far advanced. It is, however, time consuming. In bilateral renal tuberculosis, roentgen irradiation is a palliative treatment. It may also be used after nephrectomy, if tuberculosis of the remaining kidney is suspected, and to cure postoperative fistulas. Alone or combined with other treatment, it may give good results in tuberculosis of the bladder. The author has had no experience in treating intestinal tuberculosis with irradiation, but a few successes have been reported in inoperable cases. An extensive bibliography is given.

Policlinico, Rome

35: 1295-1342 (July 9) 1928. Practical Section

Malachite Green Terrain and the Isolation Technic of Tubercle Bacilli. G. Petragnani.—p. 1295.
*Clinical Contribution to Chronic Irritation Etiology of Cancer. G. Villata.—p. 1298.
Coffee Addiction and Tea Addiction. G. Dragotti.—p. 1307.

Rôle of Chronic Irritation in the Pathogenesis of Cancer.—Villata presents observations in four cases of malignant neoplasm: carcinoma developing on the site of an old biliary calculosis, carcinoma arising from a gastric ulcer, epithelioma originating from lupus cicatrices, and carcinoma of the right breast from repeated trauma of an occupational nature. On the basis of these four cases and numerous accounts in the literature, he holds that the relations between neoplastic processes and the changes resulting from chronic inflammatory processes are of such a nature that they can hardly be regarded as accidental, though the latter changes probably do not constitute the sole cause of the neoplastic process.

35: 1343-1390 (July 16) 1928. Practical Section

*Influence of Sunlight on Skin Reaction to Tuberculin. G. Genoese.—p. 1343.
Case of Foreign Body in Bronchus. G. Mammana.—p. 1346.

Influence of Sunlight on the Skin Reaction to Tuberculin.—Genoese gives a survey of the results of the researches of various authors on the influence of sunlight on the skin reaction to tuberculin. They indicate that there is an individual factor at play not only in the degree of pigmentation produced by exposure to sunlight but also in the reactivity to tuberculin, and that it is advisable, in order to avoid errors of interpretation, to apply the skin tuberculin test to parts of the body not exposed to the sun and light. The degree of weakening of the reaction is not necessarily proportional to the pigmentation.

Archiv f. exper. Pathologie u. Pharmakol., Leipzig

135: 1-130 (Sept.) 1928

Central Water Regulation and Hypophyseal Antidiuresis. S. Janssen.—p. 1.
Mechanism of Action in Several Phases: Cocaine Group. E. Rentz.—p. 19.
Influence of Temperature on Speed of Fixation and Action of Digitalis Preparations. H. Fischer.—p. 39.
*Chemotherapy of Tuberculosis. E. Hesse, G. Meissner and G. Quast.—p. 82.
*Yellow Phosphorus in Treatment of Rickets in Rats. H. Weese.—p. 111.
Comparative Investigations of Activity and Toxicity of Vapors of Lower Aliphatic Alcohol. H. Weese.—p. 118.

Chemotherapy of Tuberculosis.—Hesse et al. found that specific affinities exist between tubercle bacilli and certain groups of dyestuffs in regard to staining and to bactericidal power. They believe that Wright's method is suitable for selecting dyestuffs that should be effective in the chemotherapy of tuberculosis. They are now engaged in testing large numbers of dyestuffs and will later announce their results.

Yellow Phosphorus in Treatment of Rickets in Rats.—Young white rats were rendered rachitic by a rickets-producing diet and were then given yellow phosphorus by mouth in the form of oil. The treatment was continued for thirty days, the initial dose of from 0.4 to 0.6 mg. being gradually increased to twice these amounts. No effect on the rachitic changes in the cartilage was seen, nor did the treatment influence the development of the disease. The condensation of the subepiphyseal bony tissue (phosphorus line) does not, in Weese's opinion, have any relation to rickets. In healthy as well as in rachitic rats the administration of phosphorus produces this phenomenon. Yellow phosphorus dissolved in vitro in oil together with inactive ergosterol was without influence on the ergosterol. The phosphorus was removed by precipitation and the solution of ergosterol was fed to rats in large quantities with the rickets-producing diet. The ergosterol did not affect the development of the rickets, from which it appears that phosphorus is not able to activate ergosterol, even under optimal conditions. The ergosterol that had been in contact with the phosphorus was later exposed to ultraviolet rays. Rachitic rats given the ergosterol thus activated were promptly cured.

Deutsches Archiv für klinische Medizin, Leipzig

161: 129-256 (Oct.) 1928

Metabolism of Iodine. A. Sturm and B. Buchholz.—pp. 129 and 227.
Dependence of Blood Iodine on Ovarian Activity. D. Jahn and O. Kesselkaul.—p. 143.
Alkali Treatment and Acid-Base Equilibrium in Gastric Ulcer. L. Sahm.—p. 152.
*Treatment of Diabetes with Uneven-Carbon Fatty Acids. R. Uhlmann.—p. 165.
Motility of Stomach. H. Marx.—p. 174.

Basal Metabolism and Specific Dynamic Action of Protein in Therapeutic Malaria. K. Bahn and J. Langhans.—p. 181.
Static Thrombocytic Reactions. L. von Horváth.—p. 188.
Adsorption of Bilirubin to Protein, Its Determination and Clinical Evaluation. O. Weltmann and F. Jost.—p. 203.

Treatment of Diabetes with Uneven-Carbon Fatty Acids.—An artificial fat, differing from animal and vegetable fats in that its fatty acids have an odd number of carbon atoms, was tried out by Uhlmann on a number of patients with diabetes. He found that acetone bodies could not be formed from it. It appeared further, from the good general condition of the patients, that the artificial fat did not yield other toxic substances. Acidosis sank. He was able to withdraw all carbohydrates from the diet without producing coma, provided normal fats (butter, milk, egg yolk, etc.) were not given. His investigations threw light on certain theoretical questions. They showed, for instance, that dietary fat is oxidized in the body directly, that it is not first stored by the organism; furthermore, that little acetone is formed directly from protein, the ketonuria that follows ingestion of meat in severe diabetes being chiefly the consequence of the unfavorable influence of protein decomposition on fat oxidation.

Klinische Wochenschrift, Berlin

7: 2037-2084 (Oct. 21) 1928

Origin of Inflammatory Leukocytosis. B. Fischer-Wasels.—p. 2037. C'td.
Action of Morphine on Heart and Respiration. H. von Hoesslin.—p. 2041.
Influence of Training on Blood Sugar Curve. A. Hofmann.—p. 2043.
*Nocturnal Paroxysmal Hemoglobinuria. J. Enneking.—p. 2045.
Nature and Etiology of Chondrodystrophy. W. Landauer.—p. 2047.
Biology and Staining of Spirochaeta Pallida. C. Stern.—p. 2050.
Influencing Titration Acidity of Urine After Peroral Administration of Strontium Salts. R. Hummel.—p. 2053.
Diseases of Vegetative Nervous System. G. Wiele.—p. 2054.
Influence of Brain on Defense Power of Organism. R. Heilig and H. Hoff.—p. 2057.
Bactericidal Power of Skin, Hair and Cerumen. G. Brann.—p. 2059.
Can Wassermann Reaction Be Replaced as Standard Method in Clinics? C. Bruck.—p. 2060.
Reply. M. Stern and T. Frank.—p. 2061.
Origin of Paroxysmal Hemoglobinuria. Ö. Fischer.—p. 2061.
Basal Metabolism and Specific Dynamic Action of Protein in Therapeutic Malaria. K. Bahn and Langhans.—p. 2062.
Sharp Foreign Bodies in Alimentary Tract. Vollmer.—p. 2062.
Influenza and Middle Ear Inflammation. G. Claus.—p. 2063.
Chemical Constituents of Blood. H. Schulten.—p. 2065.

Nocturnal Paroxysmal Hemoglobinuria.—The case of intermittent hemoglobinuria in Enneking's patient, a man, aged 37, was not one of malarial or of paralytic hemoglobinuria, or of hemoglobinuria from cold. Syphilis was excluded. The attacks occurred only at night. He came to the clinic complaining of paleness and weakness, which had been progressive during the past few years. Thirteen months previously he had noticed black urine for the first time. He had then had three attacks in one month. Recently he had had two more attacks. The attacks were accompanied by pains in the abdomen and in the back at the level of the kidneys. On examination the urine was found to contain a large amount of albumin, casts, and red and white blood cells. Spectroscopically hemoglobin was demonstrable. During the next fortnight, edemas appeared. Venous puncture showed hemoglobinemia. Twenty-four days after admission, circumscribed peritonitis appeared in the iliac fossa. Operation was performed and thrombosis of the mesenteric vessels with necrosis of the small intestine was found. The patient died while the surgeon was resecting the intestine. Under the microscope, autolytic changes were found in the kidneys. Hemosiderin was also present in some sections. The bone marrow of the ribs, vertebrae and sternum was red. In the serum of this patient an autohemolysin was determined which caused hemolysis in vitro even at a temperature of 37 C.

Medizinische Klinik, Berlin

24: 1653-1692 (Oct. 26) 1928

*Raw Diet in Diabetes. A. Schittenhelm.—p. 1654.
*Acute Aortic Pain. J. Pal.—p. 1659.
Chronic Appendicitis. L. Aschoff.—p. 1660.
So-Called Hilus Tuberculosis. A. Ghon and H. Kudlich.—p. 1661.
Relations Between Gastric Disturbance and Circulatory Organs. L. Guttner.—p. 1664.
Surgical Treatment of Cancer of Rectum. F. Sauerbruch.—p. 1666.
Serotherapy of Adder Bite. R. Otto.—p. 1668.
Spastic Ileus and Ingestion of Fruit. P. Leusden.—p. 1669.
Remission of Many Years' Duration After Splenectomy in Pernicious Anemia. A. Decastello.—p. 1671.
*Funicular Myelitis and Liver Diet. W. Wolff.—p. 1673.
Abderhalden's Reaction: Fermentative Nature of Basic Processes. E. Abderhalden and S. Buadze.—p. 1674.
Transmission of Human Melanosarcoma to Mouse with Spontaneous Adenocarcinoma. F. Blumenthal and H. Auler.—p. 1675.
Static Structure of Nails and Hair. F. Pinkus.—p. 1676.

Raw Diet in Diabetes.—Schittenhelm reports good results with raw diet in three cases of diabetes. The diets, consisting of fruits and vegetables, with oatmeal, nuts, cream and olive oil and, in one case, butter and eggs, are given in full.

Acute Aortic Pain.—Increase in pressure in the aorta does not, in Pal's opinion, cause pain unless the adventitia or the periaortic tissue is abnormally sensitive. Sudden elevation of the left half of the diaphragm from pneumatosis may cause aortic pain in elderly persons with an enlarged heart and persons with a tendency to angina pectoris, in whom the aorta is sensitive. There are persons in whom the entire aorta is sensitive. The maximum sensation is experienced between the scapulas (aortic arch). Psychic excitement, particularly anxiety, causes the paroxysms. Hyperemia of the tissue is probably at the bottom of this sensitization of the adventitial or periaortic tissue.

Funicular Myelosis and Liver Diet.—The spinal symptoms, which pointed to disease of the posterior lateral column, stood in the foreground of the clinical picture in the first case reported by Wolff. The hemoglobin percentage was 61, the erythrocyte count 1,900,000, the color index 1.7. There was no free hydrochloric acid in the stomach. Three hundred grams of liver was given daily. In nine weeks a slight bilateral foot clonus was the only remaining objective nervous symptom. The general condition and the blood picture showed corresponding improvement. When the liver treatment was begun the patient had not been able to stand alone. In the second case, the ataxia has not improved after three weeks of liver diet.

Münchener medizinische Wochenschrift, Munich

75: 1829-1868 (Oct. 26) 1928. Partial Index

*Treatment of Scarlet Fever with Behring Serum. W. Sauer and J. Schmitz.—p. 1829.
Modern Treatment with Cod Liver Oil. J. Jochims.—p. 1832.
*Diagnosis and Treatment of Overtraining. M. Brustmann and H. Hoske.—p. 1834.
*Action of Hormone of Anterior Lobe of Infantile and Fetal Pituitary on Infantile Genital Glands: Animal Experiments. H. Siegmund and A. Mahnert.—p. 1835.
Influence of Alkalis on Motility and Secretion of Stomach. M. Degener.—p. 1838.
*Diagnostic Significance of Pulse Volume. P. Engelen.—p. 1840.
*Treatment of Bronchial Asthma. E. Moos.—p. 1841.
Septic Sore Throat or Thrombophlebitis Following Sore Throat. H. Doerfler.—p. 1845.

Treatment of Scarlet Fever with Behring Serum.—The scarlet fever epidemic which provided Sauer and Schmitz's material was mild. The mortality in 640 cases was 3.84 per cent. In predominantly toxic cases serotherapy brought prompt improvement if instituted early; after the third day it was useless. Complications, either early or late, were not influenced by the serum.

Diagnosis and Treatment of Overtraining.—Brustmann and Hoske report four cases of injury from excessive participation in athletics. All were in teachers of sports (tennis, swimming, etc.). Three were in men, one in a woman. In the first a man, aged 51, had a sensation of something tearing below the left scapula while doing gymnastic exercises with the parallel bars. This was followed by a sensation of pressure and difficult breathing. The blood pressure was 115 mm. of mercury; the pulse, from 54 to 60. After ten flexions of the knee, he had dyspnea; two minutes later the pulse had not quieted. A diagnosis of general exhaustion was made; the supposed muscle tear was thought to be spasm. Injection of 10 cc. of a hypertonic alkali-phosphate-sugar solution caused immediate disappearance of the pains below the scapula and they did not return. Ten minutes after the injection the blood pressure was 110 mm. of mercury; the pulse, 54 and 60. After ten flexions of the knee there was no dyspnea and one minute later the pulse was quiet. Treatment was continued with successful results. In the other three cases the general injury was manifested where exertion had been greatest. The period of general fatigue, listlessness and disturbed sleep was followed

by inability to raise the right arm. The authors believe that this disturbance in muscle function depended on a vascular spasm with resultant atrophy. They recall the numerous nutritional disturbances of tissue, the cause of which is known to be hypertonia of the vegetative nervous system. Increased tonus of the vegetative nervous system is present even in normal training and much more in overtraining.

Action of Hormone of Anterior Lobe of Infantile and Fetal Pituitary on Infantile Genital Glands: Animal Experiments.—Experiments carried out by Siegmund and Mahnert on infantile female mice showed that the implantation of tissue of the anterior lobe of the pituitary of infantile or fetal guinea-pigs, rabbits, calves or human beings resulted in the premature establishment of estrus. The human fetus had to be at least five or six months old before its pituitary was effective in this manner. The quantity of the tissue implanted was found to be important for the result. In all cases it was far in excess of that of the mouse's own anterior lobe. This difference in quantity, they believe, explains why the implanted organ exerted an effect which the animal's own organ did not have.

Diagnostic Significance of Pulse Volume.—For three years Engelen has experimented with the "energotonometer," an instrument designed by himself for measuring pulse volume. He first tested its reliability and sensitiveness with caffeine and alcohol, which have been demonstrated pharmacologically to have antagonistic actions. In healthy persons the first hemodynamic action of caffeine is to decrease the volume of the pulse; this occurs before any influence on the blood pressure. This narrowing of the peripheral circulation is counteracted by a small amount of alcohol. Larger doses of caffeine increase the blood pressure and bring the pulse volume again to normal; i. e., the heart performs more work in order to restore the volume of the peripheral circulation to normal. By the relaxing action of alcohol the extra burden thrown on the heart is again removed. These are the laws for persons in health; in diseases of the circulatory system conditions are more complicated. He presents graphs showing the results obtained by energotonometry in various diseases. They show that blood pressure alone gives a false impression of the state of the circulation. The functional determinations of the peripheral circulation by energotonometry supplement the measurement of the blood pressure and enable one to measure the increase in the pulse volume. With a regular pulse, measurement is simple, and it is possible even with unequal filling of the pulse.

Treatment of Bronchial Asthma.—Moos believes that the psyche plays the chief rôle in keeping up this disease. It has been his experience that in most cases patients can be cured or at least made capable of work in from six to eight weeks by daily psychoanalytic treatments. The bronchiectatic pulmonary phenomena disappear. The dilatation of the lungs retrogresses wholly or in part. The sputum diminishes promptly and Charcot Leyden's crystals and Curschmann's spirals disappear. The eosinophilic cells are no longer found in the sputum and the number of eosinophils in the blood sink to normal. Medicines, particularly narcotics, are gradually withdrawn, so that at the end of the treatment the patients are getting along without any. At the beginning of treatment it is not usually possible to cut short an attack by hypnosis. Later this is more apt to succeed. He thinks, however, that it is better that the patient should recognize clearly the cause of the attack and should learn to control it, first with the help of the physician, later alone. When the morbid associations that excite the attack in the individual case are known, the thought complexes responsible can be broken up and contrary ideas can be instilled. By practice the process becomes automatic with the patient. Attacks during the night are often connected with dreams presenting instinctive wishes, the satisfaction of which appears to the patient impossible or unallowable. With reattainment of psychic equilibrium the night attacks disappear. Patients in whom he previously assumed allergic reactions and who had presented an apparent hypersensitiveness to certain substances were no longer sensitive to these substances after the completion of the psychoanalytic treatment. He believes that the specific irritation acts by way of the psyche; if the latter does not cooperate, the attack does not take place.

Wiener klinische Wochenschrift, Vienna

41: 1453-1480 (Oct. 18) 1928

Studies in Basal Metabolism. A. Löw and A. Krĕma.—p. 1453.
Distribution of Skin Icterus. F. Kovács.—p. 1456.
Flocculation and Avidity of Therapeutic Antitoxin Diphtheria Serums. R. Kraus and S. Bächer.—p. 1457.
Roentgen Demonstration of Gallstones. M. Haudek.—p. 1459.
Technic of Producing Slight General Anesthesia. E. Domanig.—p. 1462.
*Modern Treatment of Diabetes in Childhood. R. Wagner.—p. 1463.
*Pituitary Snuff in Treatment of Diabetes Insipidus. D. Adlersberg and O. Porges.—p. 1467.
Treatment of Chronic Gonorrhea in Women. C. Bucura.—p. 1468.
*Angiospastic Pains in Ear. C. Stein.—p. 1469.

Modern Treatment of Diabetes in Childhood.—Wagner believes in giving diabetic children a diet sufficient for their growth and development without regard to individual tolerance, and in giving sufficient insulin to enable them to take this diet. The amount of insulin required is usually small. It is important that a definite part of the calories be given in the form of fresh vegetables and fruit. He cites the case of a child who was treated for hypoglycemia after symptoms of beginning coma (vomiting and gastralgia) were present. The child was brought to the clinic after a twelve-hour railway journey and was apparently at the point of death. Three hundred and twenty units of insulin was given in two and one-half days and 1 liter of fluid injected into the vein each day. In five days the child had recovered. In coma the insulin administration must be continuous. A ten-hour night interval may destroy the benefit already gained. The behavior of the pulse is useful in detecting hypoglycemia during treatment for coma; arrhythmia and bradycardia speak for hypoglycemia. In young children a few units too much will result in hypoglycemia. These patients often oscillate for a long time between hyperglycemia and hypoglycemia. There may be temporary phases of hypersensitiveness to insulin. It is desirable that the diabetic child should spend the first three months of treatment in the hospital. An improved tolerance often sets in in the first three months of the disease, so that the insulin requirement is greatly diminished. But the reduction must be very gradual, and without exact control there is danger of upsetting the equilibrium established. The success of insulin and dietetic treatment depends largely on an atmosphere of tranquillity and self-control in the home. Neurasthenic parents are the greatest enemy of the diabetic child.

Pituitary Snuff in Treatment of Diabetes Insipidus.—Adlersberg and Porges report favorably on powdered posterior lobe of pituitary used as snuff in the treatment of patients with diabetes insipidus.

Angiospastic Pains in Ear.—The spasms of the arteries in these cases may be of vasomotor or of arteriosclerotic nature. The vasomotor disturbances are mostly neurasthenic in origin. Endocrine anomalies also may be a frequent cause. Phenomena of irritation of the sympathetic, such as increased pulse frequency, palpitation, feeling of anxiety, tremor and rise in blood pressure, may accompany the ear pains, especially when these occur in girls and women just before menstruation. Hypertension on a nervous basis was present in a considerable number of Stein's patients with angiospastic otalgia. In these cases there was also a sensation of pressure in the regions of the ear and of the heart, weight on the chest and general fatigue, and the otalgia was accompanied by noises in the ear and disturbances of hearing (symptoms of arteriosclerotic disease of the inner ear). In cerebral arteriosclerosis the sensations in the ear are usually unilateral and may be described as pressure, tension or stabbing or spasmodic pains. They may occur several times a day, or days or weeks may intervene between attacks. The attack may last only a few seconds or several minutes, sometimes longer. The pain is usually moderate in intensity, but in one case it was accompanied by such severe pain on pressure as to simulate mastoiditis. Pain on pressure of this sort may also be the consequence of a myalgia in the region of the head muscles. If this is the case, the insertion of the sternocleidomastoid to the tip of the mastoid process is tender and the pain radiates into the ear. There may also be tenderness of the musculature of the neck. Glasscheib ascribes such myalgias to angiospastic contractions of the muscle bundles. Angiospastic otalgias may be manifested merely by paresthesias, sensation of cold or heat, or itching. Psychic treatment is of value. Measures to relieve the peripheral vessels and establish

a regular circulation in the ear should be undertaken. In cases of arteriosclerotic diseases of the middle ear, theobromine sodiosalicylate (diuretin) may be used with advantage and the nitrites may be employed to lower vasomotor tonus. He has seen good results from diathermy.

41: 1481-1512 (Oct. 25) 1928

*Sugar Content of Skin in Physiologic and Pathologic States. E. Urbach and G. Sicher.—p. 1481.
*Independent Gastro-Intestinal Symptoms in Influenza. H. Abels.—p. 1482.
Is First or Second Stage to Blame in Protracted Labors? A. W. Bauer.—p. 1485.
*Funicular Myelitis. J. Silbermann.—p. 1487.
Occupational Skin Injuries. M. Oppenheim.—p. 1490.
International Standardization of Medicines. E. Knaffl-Lenz.—p. 1495.
Cramp and Its Treatment. S. Erben.—p. 1499.
Treatment of Contusions and Dislocations of Joints. E. Gold.—p. 1501.

Sugar Content of Skin in Physiologic and Pathologic States.—The skin, according to Urbach and Sicher, plays an important rôle in intermediary carbohydrate metabolism and in the storage of sugar. The sugar content of the skin is approximately the same for animals of the same species but varies widely for different species of animals. For man and for the mouse it is about half as much as the sugar content of the blood. For the rabbit, the guinea-pig and the rat the sugar values for skin and blood are about the same. For the dog, the skin sugar is two thirds as great as the blood sugar. In normal persons, ingestion of 100 Gm. of dextrose raises the sugar content of the skin 100 per cent, the maximum being reached after one hour. It returns to normal one hour later than the blood sugar, but in normal persons it never requires more than four hours. In diabetes both the rise and the fall of the skin sugar curve is slower than in the healthy person. Cases of latent diabetes may present a normal blood sugar curve with a diabetic skin sugar curve.

Independent Gastro-Intestinal Symptoms in Influenza, Particularly in Children.—In influenza and "influenzal colds" there sometimes occur symptoms that justify, Abels states, the assumption of a catarrhal state of the gastric or intestinal mucosa. These symptoms, total loss of appetite, extending even to fluids, heavily coated tongue, fetor and mucous vomiting, when the condition affects the stomach, colic and fluid or mucous stools, when it affects the intestine, occur independently of the course of the respiratory disease. Indeed, a fever-free interval of a day or two may separate the involvement of the two tracts. The preceding respiratory symptoms are sometimes so slight as to be overlooked and the case is considered to be one of indigestion. Abels thinks it reasonable to speak of a catarrh virus which may affect the mucous membrane of various parts of the body.

Funicular Myelitis.—Silbermann emphasizes the importance of the blood picture in the differential diagnosis of spinal cord diseases of obscure genesis and atypical symptoms. In the association of funicular myelitis and pernicious anemia, the blood changes and the nervous disturbances do not, however, always run parallel. The one may precede the other by years. The same treatment relieves sometimes one set of phenomena, sometimes the other. A number of illustrative case histories are presented.

Zeitschrift f. d. ges. Neurol. u. Psychiatrie, Berlin

116: 327-644 (Oct. 5) 1928

Rôle of Hereditary Constitution in History. H. Luxenburger.—p. 327.
*Sodium Chloride Content of Cerebrospinal Fluid in Normal and Pathologic Cases. F. Lickint.—p. 348.
Psychic Picture of Eunuchoidism and Organic Basis of Compulsion Syndrome. E. Levinger.—p. 371.
*Relapsing Fever Treatment of Progressive Paralysis. C. Grabow and J. Krey.—p. 382.
Polio-Encephalitis Haemorrhagica Superior (Wernicke). F. Lüthy and K. M. Walthard.—p. 404.
Neuropsychic Reactions to Earthquakes. L. Brussilowski.—p. 442.
Physiology and Pathophysiology of Coordination. H. Altenburger.—p. 471.
Pathophysiology of Sweat Secretion. L. Guttmann and C. F. List.—p. 504.
Psychic Reactions to Earthquakes. N. Bruchanski.—p. 423.
Eidetic Predisposition and Constitution. E. Liefmann.—p. 537.
*Mammary Gland Secretion in the Man. E. Levinger.—p. 559.
Habitus and Character in Melancholic Women in Menopause and Presenile Age. F. Gravestein-Briedé and F. J. Stuurman.—p. 570.
Mechanism of Transformation of Sex. E. A. D. E. Carp.—p. 605.
Brain Changes in Acute Carbon Monoxide Poisoning. W. Weimann.—p. 632.
Reply. R. Altschul.—p. 641.

Sodium Chloride Content of Cerebrospinal Fluid in Normal and Pathologic Cases.—Lickint examined 450 cerebrospinal fluids for their content of sodium chloride, using Volhard-Neubauer's method. From seventy cases he established the normal value as between 704 and 783 mg. per hundred cubic centimeters of fluid; the largest number lay between 720 and 775 mg., about 140 mg. higher than the sodium chloride value for serum. The observation of certain authors that the sodium chloride of the cerebrospinal fluid is diminished when the protein is increased was not confirmed. In thirty-five specimens from patients with chronic nephritis with and without uremic symptoms, decrease was found six times; normal figures, fifteen times, and distinct increase, fourteen times. No clear differences could be made out between the different forms of nephritis as regards the sodium chloride of the cerebrospinal fluid. In eclampsia the values were almost always normal. There were no important deviations from the normal in the few cases of diabetes (with or without coma) or in the forty-five cases of latent syphilis and cerebrospinal syphilis. There was distinct decrease in two out of eight specimens from patients with tabes. Other neurologic diseases gave for the most part normal values, but in most of 154 specimens representing all forms of meningitis lower values (from 580 to 700 mg.) were present. The sodium chloride determinations do not give reliable aid in the differential diagnosis between different forms of meningitis or in prognosis. In meningism, normal values were found. Values below 670 mg. speak with great probability for the presence of meningitis, but it should be remembered that equally low values are sometimes present in uremia.

Relapsing Fever Treatment of Progressive Paralysis.—Grabow and Krey report on 129 cases of paresis treated with African relapsing fever. They consider that the dangers from the inoculation are greater than have been supposed. Numerous and serious complications occurred and there were eighteen deaths, some of which they believe must be attributed to the treatment. Two different types of fever were seen. In one there were attacks of fever each limited to a few days, in some cases with pseudocrises. In the other type the fever did not run so high but continued uninterruptedly for from twenty-six to fifty days. The greatest number of attacks of fever noted in a single case was eight; on the average there were four or five attacks. The temperature usually reached its greatest height (from 39.2 to 41.2 C. in the axilla) in the first or second attack. The intervals between the latter attacks were in some cases very long (from sixty-four to sixty-six days, in one case 113 days). In the evaluation of the results of the treatment, ninety-six cases, including ten of taboparesis, are considered. In all the disease was in a fully developed form. In the thirty-seven cases in which the observation period was at least two years, full remission was obtained in 11.1 per cent; high grade partial remission in 11.1 per cent; low grade partial remission (somatically improved and able to work in the institution), in 16.7 per cent; no change or chronic progression, in 22.2 per cent; death occurred in 38.9 per cent. In the groups with less than two years' observation the figures were better. In three cases the treatment was followed by symptoms of tertiary syphilis of the skin and periosteum.

Mammary Gland Secretion in the Man.—A youth, aged 19, with feminine physical and psychic characteristics and with phenomena suggesting Bergmann's "vegetative stigmatization," noticed for the first time a peculiar sensation in the nipples. Moderate pressure brought forth a whitish fluid which was found to contain colostrum corpuscles. This observation was repeated on a number of occasions. When several days intervened, the secretion was so abundant that on pressure it spurted out in a stream. The patient states that he has had no particular sensations in the nipples since the first occasion. Hard mammary glands, larger than a cherry, are palpable on both sides. Montgomery's glands were highly developed on one side. Among forty men between 18 and 45 years of age Levinger found three further cases of whitish secretion from the nipples on pressure, but in only one of these cases were colostrum corpuscles found. Mammary glands were not palpable in any of these three cases. The physical proportions were eunuchoid in one case, Montgomery's glands were particularly well developed in one, and in one the sexual instinct was typically homosexual.

Zeitschrift für Tuberkulose, Leipzig

52: 1-96 (Sept.) 1928. Partial Index

Importance of Home and School in Spread of Tuberculosis Among Children. T. Rehberg.—p. 1.
*Forms and Frequency of Congenital Tuberculosis in Nurslings. K. Scheer.—p. 5.
Importance of Tuberculosis Prophylaxis in Children for Prevention of Tuberculosis in Adults. B. Gettkant.—p. 13.
Typical Filtrable Form of Tubercle Bacillus. L. Rabinowitsch-Kempner.—p. 18.
Relation of Tuberculous Meningitis and Other Forms of Tuberculosis. K. Klare.—p. 25.
Pathologic Anatomy of Tuberculosis of Mesenteric Lymph Nodes. M. Bock.—p. 30.
*Critical Consideration of Blood Picture Findings in Tuberculosis in Children. L. Hindersin.—p. 34.
Spread of Tuberculosis in Ukrainian Villages. M. Morosowski.—p. 46.

Forms and Frequency of Congenital Tuberculosis in Nurslings.—Although until recently most authors did not believe in the congenital transmission of tuberculosis, Scheer found that children who had never come in direct contact with tuberculous persons died from tuberculosis. The author describes two different forms of infection: (1) placental infection with primary changes in the periportal lymph nodes; (2) infections with primary changes in the respiratory tract. He states that about 5 per cent of the cases of tuberculosis in nurslings are congenital.

Necessity for Critical Consideration of Blood Picture Observations in Tuberculosis in Children.—According to observations of Hindersin it is impossible to make a definite diagnosis of tuberculosis in children from the blood picture, since the relations of the blood corpuscles in the blood of children are different from those of adults. A constantly bad blood picture indicates an unfavorable prognosis but a temporarily good blood picture may indicate a favorable prognosis for only a short time. In all cases, however, the blood picture is of great value for controlling the therapy.

Klinicheskiy J. Saratov. Universiteta, Saratof

5: 83-199 (Feb.) 1928

*Syphilitic Infection from Cadavers. P. S. Grigoriev and K. G. Jarysheva.—p. 83.
Treatment of Hemorrhoids by Bensaude's Method. E. U. Machlin.—p. 93.
Relation Between Oppenheim's Phenomenon and Defense Reactions. V. A. Ershov.—p. 103.
Traumatic Rupture of Intestine. A. A. Krylov.—p. 111.
Calculus of Kidney; Errors of Roentgenographic Diagnosis. A. S. Vinogradov.—p. 123.
Case of Fox-Fordyce Disease. A. F. Uhin.—p. 129.
Mixed Tumors of Kidney in Children. B. A. Nikitin.—p. 135.
Melancholia with Amnesia Diagnosed and Treated by Hypnosis. N. N. Evplova and A. M. Factorovich.—p. 145.
Nonparasitic Splenic Cysts. V. E. Lebedev.—p. 155.
Etiology, Prophylaxis and Treatment of Measles. S. A. Kuliabko.—p. 159.

Syphilitic Infection from Cadavers.—Grigoriev and Jarysheva studied the stability and vitality of syphilitic virus in dead tissues. Their experience proves the possibility of infection from syphilitic cadavers. A macerated syphilitic fetus served as their material. The agent of the disease remained virulent in the refrigerator for forty-eight hours after the birth of the fetus. This was confirmed on rabbits which were inoculated with pieces of the diseased liver, placenta and umbilical cord. Typical chancre with spirochetes in the tissue juices developed two weeks after the inoculation. Silver preparations of the liver of the fetus showed the presence of a few spirochetes after the tissue had been in the refrigerator for from seventy-two or ninety-six hours and even six or ten days after the birth. The inoculations with these organisms gave negative results.

5: 417-526 (April) 1928

*Etiology, Diagnosis and Treatment of Some Forms of Hemorrhagic Mucous Colitis. I. E. Jachontov.—p. 417.
*Embolism of Pulmonary Artery as Cause of Sudden Death After Surgical Operations. N. N. Nasarov.—p. 427.
Diseases of Apex of Root of Tooth and Surrounding Tissues; Surgical Treatment. L. M. Permut.—p. 435.
Hypnolepsy. V. S. Drapkin.—p. 441.
Changes in Blood Resulting from Autohemotherapy of Carcinoma of Uterus and Vomiting of Pregnancy. T. I. Dikova.—p. 449.
Rhinoplasty. M. P. Shatkinskiy.—p. 463.
Destructive Hydatid Mole. A. A. Ilyin.—p. 473.
Case of Blastomycosis of Skin (Gilchrist). N. M. Levchanovskiy.—p. 479.
*Two Cases of Vaccine Exanthem. M. Kourochkin.—p. 491.
*Case of Sarcoma of Cranium. V. N. Stern.—p. 495.

Etiology, Diagnosis and Treatment of Some Forms of Hemorrhagic Mucous Colitis.—Jachontov resorted to local vaccination with a bouillon vaccine in several cases of hemorrhagic mucous colitis. After the culture was from 10 to 12 days old, it was exposed to a temperature of 60 C. It was then introduced by duodenal tube into the cecum. One patient, aged 57, had had the disease for three years. Bacteriologic examination showed an almost pure culture of *Bacillus coli.* Local autovaccine therapy did not give satisfactory results. In a second patient, aged 31, the disease was of seven months' duration. Although dysentery bacilli were not found, 200 cc of bouillon culture of *Bacterium dysenteriae* (Flexner) was introduced twice, with a three day interval, with favorable results. In four cases the author thinks that *Trichomonas* was the cause of the disease. Hemorrhagic diarrhea had been present in one for three years, in two for five years and in one for ten years. Microscopic examinations showed the presence of *Trichomonas hominis.* Neoarsphenamine preparations were administrated through the duodenal tube with success. In the last case described the author found visceral syphilis to be the cause of the colitis and symptomatic treatment was given.

Embolism of Pulmonary Artery as Cause of Sudden Death After Surgical Operation.—Nasarov describes three cases of sudden death from embolism of the pulmonary artery established by necropsy. One patient, an obese woman, aged 45, was operated on for goiter under local anesthesia. She stood the operation well and no complications developed. At the end of twenty-four hours she died on attempting to raise herself up in bed. The second patient, a woman, aged 38, operated on for an ovarian cyst, felt well for five days after the operation. She suddenly went into convulsions and died while being taken to the dressing room. The third patient, an obese woman, operated on for cancer of the lower lip, collapsed fifteen minutes after she was brought to her room and died shortly after an attempt to restore respiration. After a short review of the literature on embolism of the pulmonary artery, Nasarov advises a careful use of prophylactic measures before, during and after operations. In case of embolism the surgeon should be prepared to perform Trendelenburg's operation.

Two Cases of Vaccine Exanthem.—After the use of scarlet fever vaccine of the same series, Kourochkin observed a rash of identical nature in two children. The exanthem was accompanied by rise of temperature. A test of the sensitiveness of the skin was made with iodine and indicated sensitiveness to certain irritants. In one of the children it was evidently hereditary, as iodine applied to the mother's skin caused a reaction on every occasion.

Case of Sarcoma of Cranium.—Stern describes a case of sarcoma of the cranium of traumatic origin. The patient had had two hard blows on the head with loss of consciousness. Severe headaches followed and a swelling was detected. The diagnosis of fracture of the left frontal bone was made and operation was begun but could not be finished on account of severe hemorrhage. The following month the patient had typhus and the second operation was postponed. The growth on the site of the previous operation reached considerable dimensions in a year. It was firm, elastic, fluctuant in some places. Separate serrated portions could be felt. A grinding sound was heard on palpation. The roentgenogram showed destruction of the dome of the cranium. The tissue was typical of osteosarcoma. Roentgen therapy was proposed, as the case was inoperable.

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Effect of Increased Oxygen Pressure on Normal Guinea-Pigs, with Special Regard to Blood Picture. K. Barmwater.—p. 589.
*Globulin and Albumin in Serum and Urine. T. Geill.—p. 612.

Globulin and Albumin in Serum and Urine.—Geill reports on the results of investigations on the precipitation of serum proteins and urinary proteins by means of ammonium sulphate and on the dependence of the process on salt concentration, hydrogen ion concentration, protein concentration and temperature, as well as the urinary constituents, particularly sodium chloride and urea. His work is to be regarded, he says, as a preliminary study to be followed by a series of clinical investigations.